

# **Exhibit H**

(JPMC Exhibit 7)

**(Part 1 of 2)**

*Wapp Tech Limited Partnership et al. v. JPMorgan Chase Bank, N.A.*, No. 4:23-cv-1137 (E.D. Tex.)

**EXHIBIT E-4c**

**Invalidity of U.S. Patent No. 10,691,579 Based on the Flash MX Professional 2004 System**

As described in the following claim chart, claims 15–20, 26–29, 33, and 34 of U.S. Patent No. 10,691,579 (the '579 patent) are invalid because they are anticipated under 35 U.S.C. § 102 by the Flash MX Professional 2004 system and/or would have been obvious under 35 U.S.C. § 103 over the Flash MX Professional 2004 system and/or the knowledge of a person of ordinary skill in the art ("POSA").

The Flash MX Professional 2004 software product was publicly released by Macromedia, Inc., no later than September 10, 2003. Manuals and other publications describing Flash MX Professional 2004 were concurrently available. The i-mode HTML Simulator feature was concurrently available, and instructions for downloading and using the feature were concurrently available and provided with Flash MX Professional 2004. A software update for Flash MX Professional 2004, adding Flash Lite 1.1 functionality, was publicly released by Macromedia, Inc., no later than June 26, 2004. Manuals and other publications describing Flash Lite 1.1 were concurrently available. Under the EDTX Model Order Focusing Patent Claims and Prior Art to Reduce Costs, "associated references that describe that instrumentality shall count as one reference, as shall the closely related work of a single prior artist." (EDTX Model Order Focusing Patent Claims and Prior Art to Reduce Costs, at 1 n.1.) The following associated references all describe the Flash MX Professional 2004 instrumentality and, therefore, together with the software product itself collectively count as one reference ("Flash MX Professional 2004 system" or "Flash MX Professional 2004"):

- *Flash MX 2004 Using Flash*, copyright Macromedia, Inc., dated September 2003, provided with the software product and concurrently published at <http://www.macromedia.com/support/documentation/en/flash/> ;
- *Flash MX 2004 Getting Started with Flash*, copyright Macromedia, Inc., dated September 2003, provided with the software product and concurrently published at <http://www.macromedia.com/support/documentation/en/flash/> ;
- *Flash MX Professional 2004 Flash Lite Authoring Guidelines for the i-mode Service by NTT DoCoMo*, copyright Macromedia, Inc., dated March 2003, provided with the software product and concurrently published at <http://www.macromedia.com/support/documentation/en/flash/> ;
- *Flash MX Professional 2004 Flash Lite User Guide*, copyright Macromedia, Inc., dated August 2003, provided with the software product and concurrently published at <http://www.macromedia.com/support/documentation/en/flash/> ;
- Bill Perry, *New Features for Mobile and Devices Developers in Macromedia Flash MX Professional 2004* ("Perry"), published by Macromedia, Inc., no later than September 9, 2003, concurrently with and on the same website as the software product;
- Matthew David, *Building Great Flash MX Games* ("David"), copyright date 2003;
- *Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines*, copyright Macromedia, Inc., dated June 2004 and concurrently published at <http://www.macromedia.com/support/documentation/en/flash/> .

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Because the Flash MX Professional 2004 software product with its Flash Lite 1.1 update was released no later than June 2004, the Flash MX Professional 2004 system qualifies as prior art at least under pre-AIA 35 U.S.C. §§ 102(a) and (b) based on Wapp's earliest claimed priority date of June 10, 2005 (the date of Provisional Application No. 60/689,101). As set forth in Defendant's ("JPMC's") accompanying invalidity contention cover pleading, the Flash MX Professional 2004 system is prior art under pre-AIA 35 U.S.C. §§ 102(a) and (b) if it is determined that this asserted patent is entitled to a priority date of June 9, 2006 (the filing date of U.S. Patent App. No. 7,813,910). The Flash MX Professional 2004 system additionally qualifies as prior art at least under pre-AIA 35 U.S.C. § 102(f). The named inventor of the asserted patent admitted possessing prior knowledge of Flash and related technologies, including Flash Lite 1.1, Flash MX, Flash MX Professional 2004, and Studio 8, from Macromedia, Inc., as demonstrated in at least the Provisional Application No. 60/689,101 and U.S. Patent App. No. 7,813,910 and associated prior art disclosures, and in prior deposition testimony. Wapp also admits that the named inventor of the asserted patent possessed prior knowledge of Flash technology and in particular that the purported invention was a purported improvement on Macromedia's Flash development environment, as demonstrated at least in Wapp's response on May 8, 2024, to JPMC's interrogatory number 8.

To the extent the Flash MX Professional 2004 system does not expressly or inherently disclose one or more of the limitations of the claims, such limitations would have been obvious in view of the teachings of the Flash MX Professional 2004 system in combination with the knowledge of a POSA and/or one or more of the references identified in JPMC's Invalidity Contentions.

JPMC notes that obviousness analysis involves an expansive and flexible approach that takes into account the background knowledge, creativity, and common sense of a POSA. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 421 (2007). Accordingly, JPMC reserves the right to supplement these statements of obviousness based on further discovery and developments in this case, such as the Court's claim construction.

The chart below provides representative examples of where each element of each claim is found in the referenced prior art. Citations are meant to be exemplary, not exhaustive, and JPMC reserves the right to identify and discuss additional portions of the referenced prior art in support of its contentions and/or to rebut arguments made by Wapp. Citations to figures, drawings, tables, and the like include reference to any accompanying or related text. All internal cross references are meant to incorporate the cross-referenced material as if fully set forth therein.

Wapp's Infringement Contentions have not established that JPMC infringes any valid claim. Thus, JPMC's statements below should not be treated as an admission, implication, or suggestion that JPMC agrees with Wapp regarding either the scope, construction, or interpretation of any of the claims, or the infringement theories advanced by Wapp in its Infringement Contentions, including whether any claim satisfies 35 U.S.C. §§ 101 or 112. In certain cases, JPMC specified non-limiting examples of where its application of the prior art is based on Wapp's apparent application of the claim limitation in the Infringement Contentions. These statements are not

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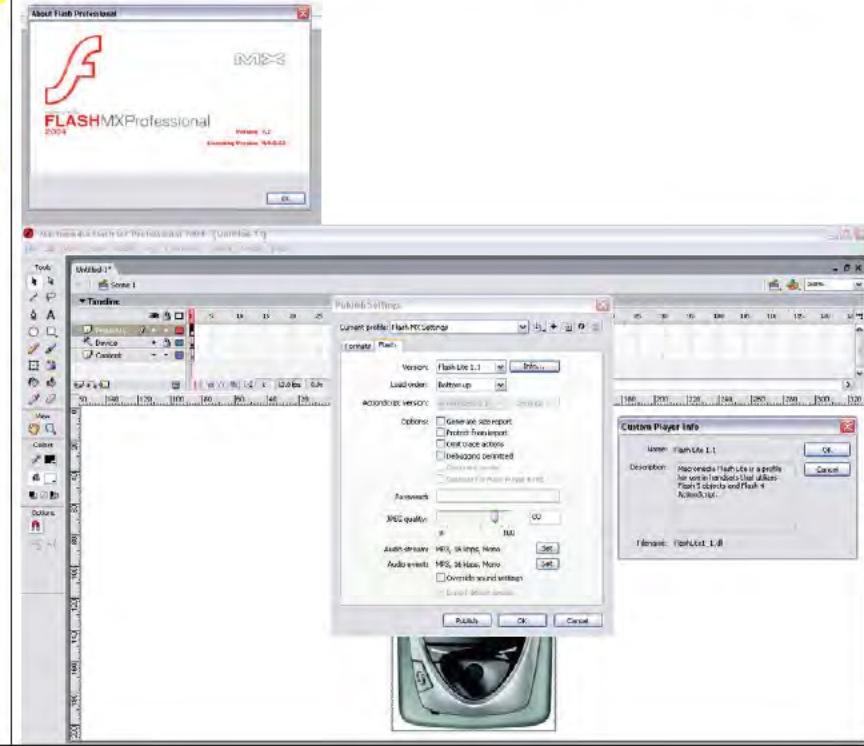
intended to suggest that JPMC agrees with Wapp's application of any claim term. The Court has not yet construed any disputed terms and, therefore, these invalidity contentions take into account all possible constructions. JPMC reserves the right to supplement these contentions after receiving the Court's claim construction or any Court ruling or change of position by Wapp on the priority dates to which Wapp is entitled.

Wapp has yet to identify in this case, any limitation of the claims that it contends is not anticipated and/or rendered obvious by the referenced documents, and/or knowledge of a POSA. JPMC therefore expressly reserves the right to respond to any such contention, including by identifying additional obviousness citations and/or combinations, if Wapp makes any such contentions.

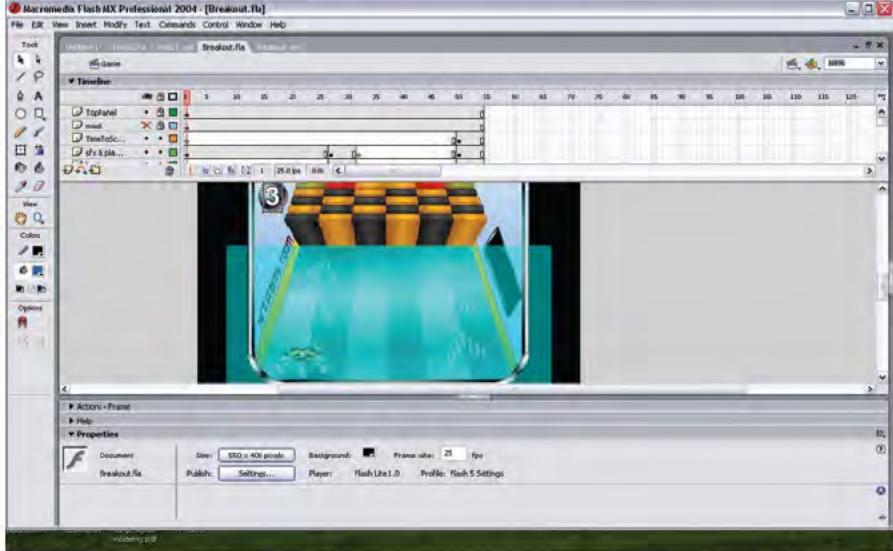
JPMC takes no position in these Invalidity Contentions on whether the preamble of each independent claim is limiting. To the extent each is limiting, the chart below provides examples of where each preamble limitation is found in this prior art.

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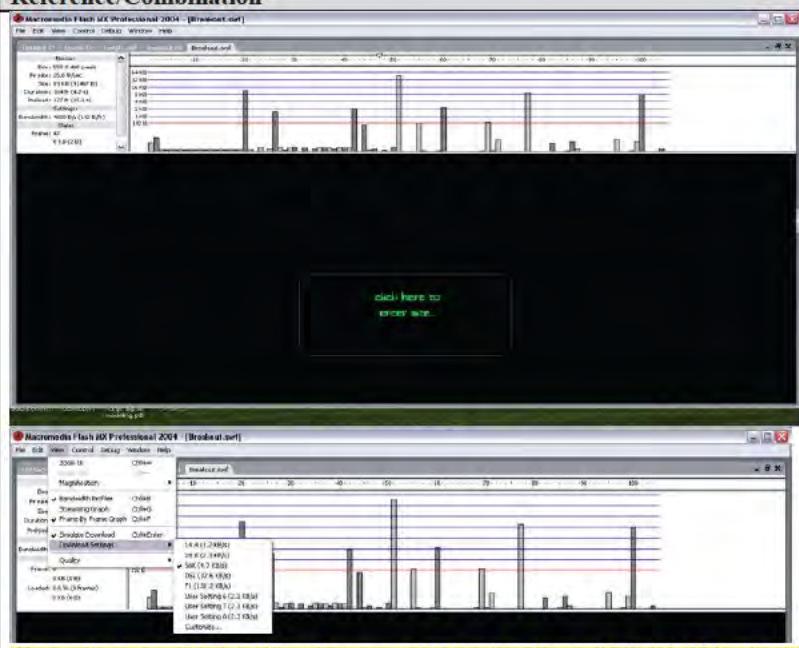
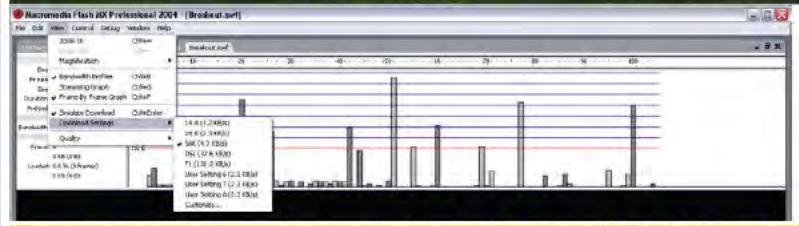
**'579 patent**

'579 Claim 15	Reference/Combination
15[a] A non-transitory, computer-readable medium comprising software instructions for developing an application to be run on a mobile device, wherein the software instructions, when executed, cause a computer to	<p>The Flash MX Professional 2004 system discloses this limitation.</p> <p>For example, the following are screenshots from Flash MX Professional 2004.</p>  The screenshot displays three windows. At the top is the 'About Flash Professional' dialog box, which shows the Flash logo, 'FLASH MX Professional 2004', and 'Version 1.0'. Below it is the main workspace titled 'Skinned 1', showing a timeline with frames numbered 100 to 200. To the right of the workspace is the 'Publish Settings' dialog box, which is open to the 'Format' tab. This dialog box allows users to choose 'Flash Lite 1.1' as the target format, set the 'Load order' to 'Bottom up', and specify 'ActionScript version' as 'AS 2.0'. It also includes sections for 'Options' (checkboxes for 'Generate score report', 'Protect framework', 'Create trace actions', and 'Behaviors generated'), 'Parameters', 'MPEG qualities', 'Audio streams', 'Audio events', and 'Override sound settings'. At the bottom of the 'Publish Settings' dialog is a 'Preview' button. In the bottom right corner of the screen, there is a small preview window showing a mobile device displaying a Flash Lite application.

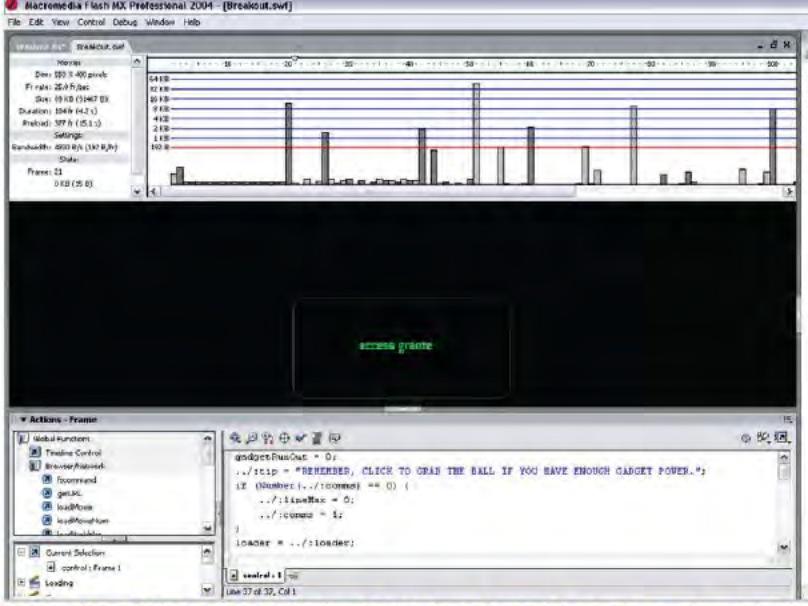
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'579 Claim 15	Reference/Combination
	<p>Flash MX Professional 2004 with Flash Lite 1.1 update and NTT DoCoMo i-mode simulator 7.2 feature. Flash MX Professional 2004 is a system for developing and testing an application for a mobile device, and it can publish Flash applications to "handsets" (see above window entitled "Custom Player Info").</p> <p>For example, Flash MX Professional 2004 enables a user to write code to develop visual applications such as animated games using the Flash MX Professional 2004 interface, which consists of at least a stage for imagery and a grid for a timeline. Flash MX Professional 2004 also enables the use of ActionScript, a programming language.</p> 

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'579 Claim 15	Reference/Combination
	  <p>Above is a screenshot of the software authoring interface of Flash MX Professional 2004 using Breakout.fla and Breakout.swf from Flash MX 2004 Games by Nik Lever.</p>

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'579 Claim 15	Reference/Combination
	 <p>Screenshot of Flash MX Professional 2004 interface with “Actions – Frame” window enabling editing ActionScript scripts within the Flash application.</p> <p>For example, Flash MX Professional 2004 was provided on a CD (non-transitory, computer-readable medium comprising software instructions) and alternatively as a downloadable file intended for storage on a hard drive or other storage medium (non-transitory, computer-readable medium comprising software instructions).</p> <p>[Flash MX 2004 Getting Started with Flash, p. 14]</p>

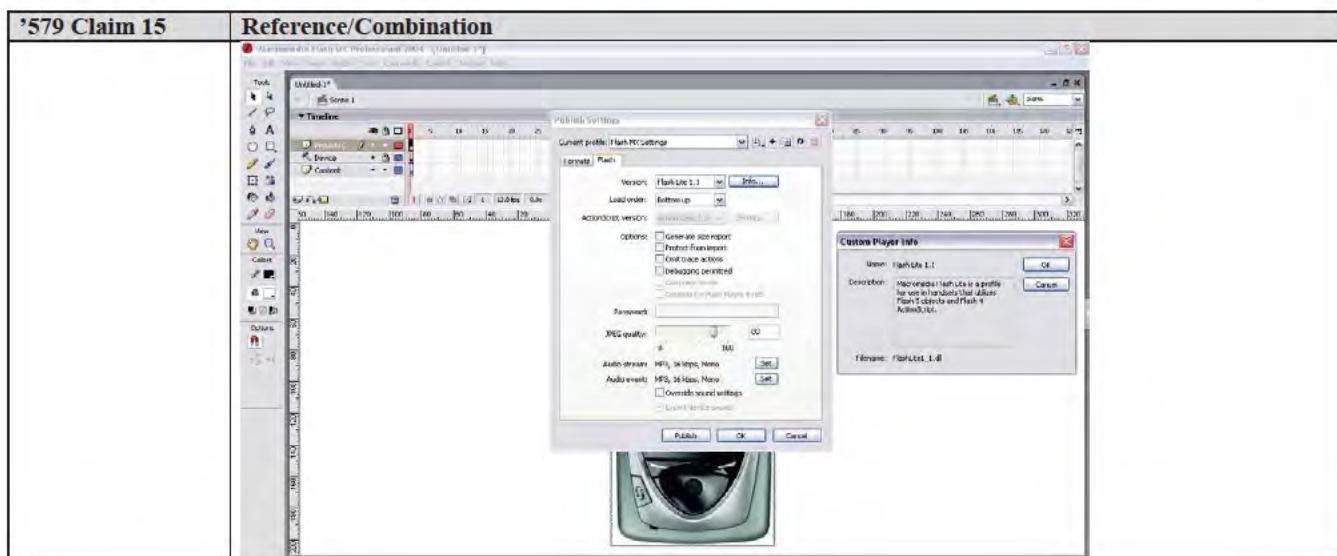
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'579 Claim 15	Reference/Combination
	<p>Do one of the following to start the installation process: [¶] (Windows) If you have a CD, insert it in your CD drive. A Flash movie plays that guides you through installation choices. [...] If you have downloaded Flash from the Internet, double-click FlashMX2004Installer.exe (Windows), or double-click the Installer icon (Macintosh) and follow the onscreen instructions.</p> <p>For example, Flash MX Professional 2004 is software installed on the user's computer. Intrinsic to software installation is a non-transitory, computer-readable medium comprising software instructions.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 178]</p> <p>You can install the FLV Export plug-in after installation of Flash MX Professional 2004 is complete.</p> <p>For example, Flash MX Professional 2004 comprises software instructions for developing an application to be run on a mobile device.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 390]</p> <p>Flash content is viewable across multiple browsers, platforms, and mobile phones. You can author the following:</p> <ul style="list-style-type: none"><li>• High-quality animations</li><li>• Games</li><li>• Rich-media custom user interfaces for devices and desktop systems</li><li>• Immersive e-commerce and business solutions [¶]</li></ul> <p>In addition, Flash files are compact, making them perfect for wireless carrier networks, where transfer rates range between 9.6 and 60 kilobytes per second (Kbps). Mobile devices, unlike desktop computers, have limited storage capability, so the small footprint of Flash is ideal. [¶]</p> <p>The mobile device templates let you create content for many mobile devices available today. Use the device skins in the templates to preview your content as it will look on the device. [¶] Note: The skins are on guide</p>

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'579 Claim 15	Reference/Combination
	<p>layers and won't export with your content or appear at runtime. [¶] For more information on authoring Flash files for mobile devices, please visit the Macromedia Mobile Devices site at <a href="http://www.macromedia.com/devnet/devices/">www.macromedia.com/devnet/devices/</a>.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 39]</p> <p>Close the test window to return to the normal authoring environment. [¶] Once you've set up a test environment incorporating the Bandwidth Profiler, you can open any SWF file directly in test mode. The file opens in a Flash Player window, using the Bandwidth Profiler and other selected viewing options.</p> <p>[<i>Flash MX Professional 2004 Flash Lite User Guide</i>, p. 5]</p> <p>Macromedia has created a new Flash Player version, called Macromedia® Flash™ Lite, that runs on a new class of consumer mobile devices. This format is designed to run optimally on devices with limited resources (memory, processor speed, display area). [...] With Macromedia Flash MX Professional 2004, you can author, preview, publish, and validate content for Flash Lite.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 18]</p> <p>ActionScript is the Flash scripting language that enables you to add complex interactivity, playback control, and data display to a Flash document. You can add ActionScript within the Flash authoring environment using the Actions panel [...]</p> <p>To the extent this limitation is not explicitly disclosed by the Flash MX Professional 2004 system, it is inherent or would have been obvious to a POSA from the teachings of the Flash MX Professional 2004 system, the knowledge of a POSA, and/or one or more of the references identified in JPMC's Invalidity Contentions.</p>
15[b] select one or more characteristics associated with a mobile device:	The Flash MX Professional 2004 system discloses this limitation.

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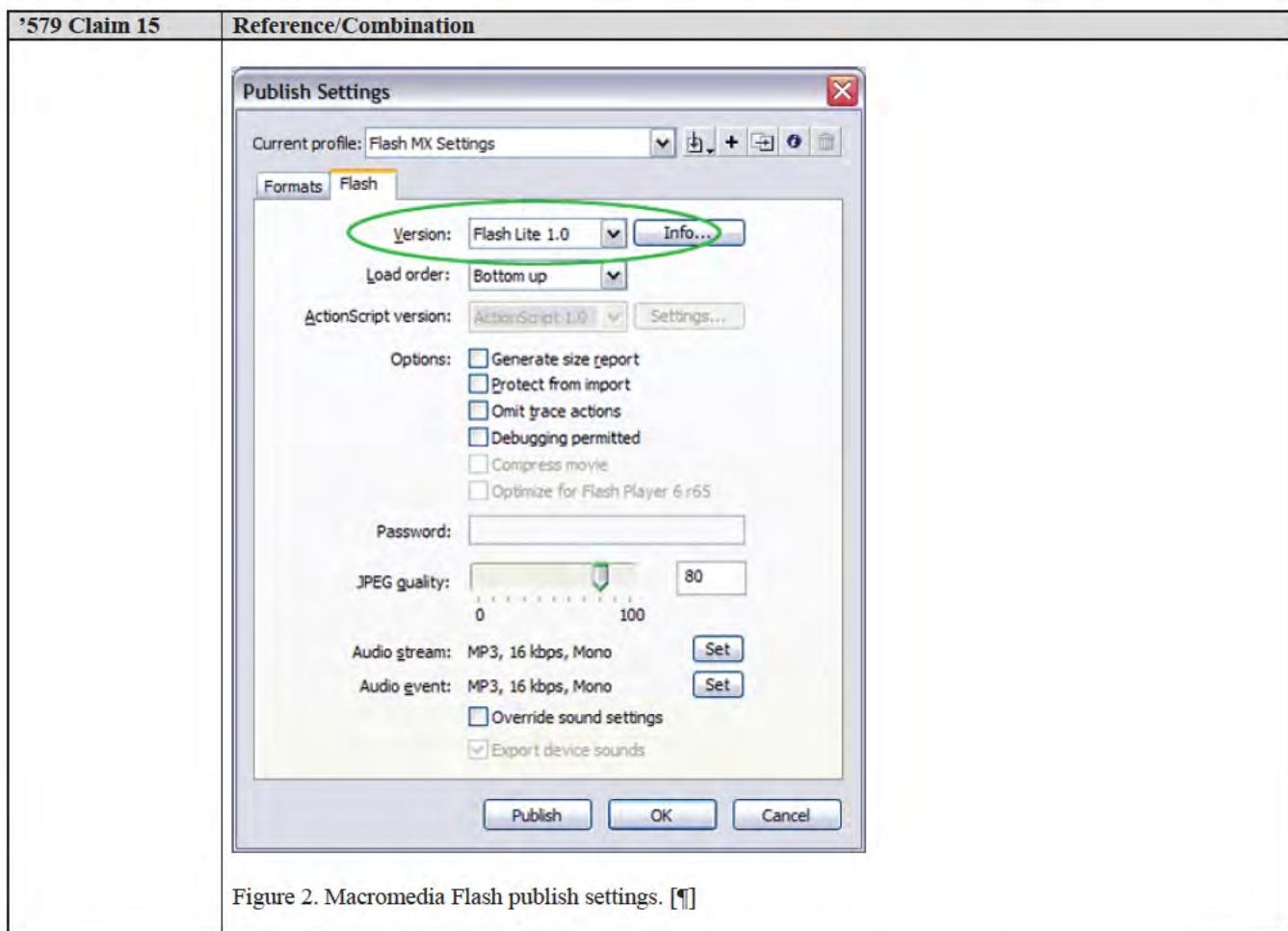
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'579 Claim 15	Reference/Combination
	 <p>Screenshot of Flash MX Professional 2004 showing selecting at least the Flash Player version.</p> <p>For example, Flash MX Professional 2004 selects a Flash Player version. A mobile device may support one or more versions of Flash Player, so a Flash Player version is a characteristic associated with a mobile device.</p> <p><i>[Flash MX 2004 Using Flash, p. 282]</i></p> <p>Click the Flash tab and select a Player version from the Version pop-up menu. Not all Macromedia Flash MX 2004 and Macromedia Flash MX Professional 2004 features work in published SWF files that target Flash Player versions earlier than Flash Player 7. If you want to specific Flash Player detection, on the HTML tab of the Publish Settings dialog box, you must select Flash Player 4 or a later version. For more information about Flash Player detection, see “Configuring publish settings for Flash Player detection” on page 287.</p>

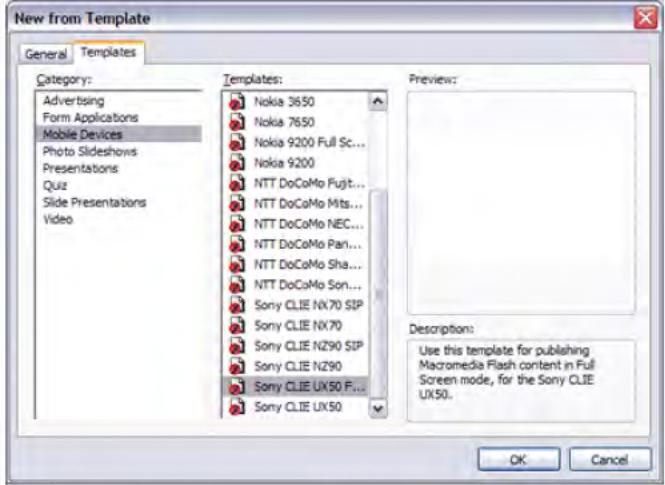
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'579 Claim 15	Reference/Combination
	<p>[<i>Flash MX 2004 Using Flash</i>, p. 287]</p> <p>You can configure your document to detect your users' Flash Player version. If you've selected Detect Flash Version in the Publish Settings dialog box, users who access your Flash application are transparently directed to an HTML file that contains a SWF file designed to detect their Flash Player version. If they have the specified version or later, the SWF file again redirects the user to your content HTML file, and your SWF file plays as designed. If users don't have the specified version, they're redirected to an alternate HTML file that Flash creates, or that you've created.</p> <p>[Perry]</p> <p>New Features for Mobile and Devices Developers [¶] Both products offer the new mobile devices templates, however, only Macromedia Flash MX Professional 2004 provides functionality specific to mobile device development:</p> <ul style="list-style-type: none"><li>Mobile devices templates</li><li>MIDI ring tone support</li><li>Test device emulators</li><li>Alias text support [¶]</li></ul> <p>In the following section, I'll give you a little more information about these new features and what they mean to you. [¶]</p> <p>Authoring Content for Devices [¶] Exporting Content for Various Versions of Macromedia Flash Player [¶] When authoring for mobile devices, you need to use the correct Macromedia Flash publish settings based on the Macromedia Flash Player requirements of your target device. For more information on some of the devices that play Macromedia Flash content, refer to the Mobile and Devices Developer Center for a list of devices and content development kits for each. [¶]</p> <p>To customize your Macromedia Flash publish settings, you can select an option from the Flash tab of the Publish Settings window. You can access this window in three different ways:</p> <ul style="list-style-type: none"><li>Select File &gt; Publish Settings.</li><li>Press the Settings button on the Property inspector with the Stage selected.</li><li>Use a keyboard shortcut: Control-Shift-F12. [¶]</li></ul>

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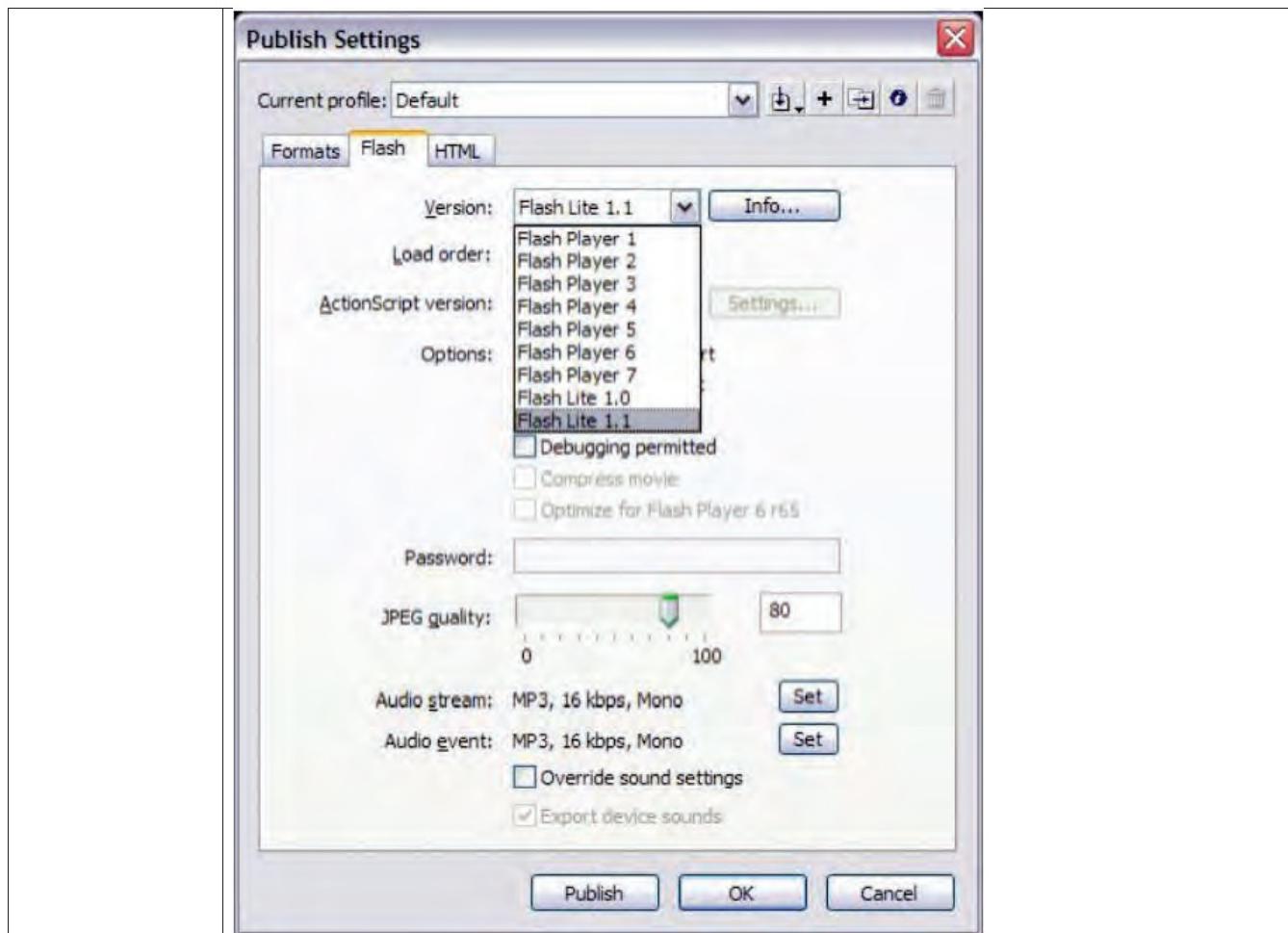
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'579 Claim 15	Reference/Combination
	<p>If you're using the built-in templates for devices, then Flash presets the Flash Player publish settings for each device. However, if you're not using the templates, then you'll need to ensure that you customize the settings for your device. [¶] The only setting you need to change is the Version setting. Select the proper version of Macromedia Flash Player in the pop-up menu. The rest of the settings are optional and you can refer to the Flash MX Professional 2004 Help panel for additional information on them. [...]</p> <p>Device Templates [¶] New to Macromedia Flash MX Professional 2004 and Macromedia Flash MX 2004 are 22 templates you can use to create content for all of the currently supported mobile devices. You can access them from the Flash start page or by selecting File &gt; New. Click the Template tab in the New from Template dialog box (Figure 6) and select Mobile Devices in the Category pane. [¶]</p>  <p>Figure 6. Mobile Devices templates. [¶]</p>

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'579 Claim 15	Reference/Combination
	<p>These templates take the guess work out of developing Macromedia Flash content for specific platforms. They set the correct stage size, load a full-size image of the specific device in a guide layer, and preset the correct Flash publishing settings. All you need to do is to create the content based on the development kit recommendations for each platform. You can find content development kits for each platform in the Macromedia Mobile and Devices Developer Center. [¶]</p> <p>For example, if you open up the iPAQ 5440 Full Screen template, here's what you will see: [¶]</p>  <p>Figure 7. iPAQ 5440 Full Screen template opened in the authoring environment. [¶]</p> <p>Be sure to use these templates when creating content for mobile devices—they'll definitely save you time.</p> <p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 24]</p>

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'579 Claim 15	Reference/Combination
	<p>For example, Flash MX Professional 2004 selects a frame rate and stage size (screen size), both characteristics associated with a mobile device.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 10]</p> <p>2. For Frame Rate, enter the number of animation frames to be displayed every second. For most computer-displayed animations, especially those playing from a website, 8 fps (frames per second) to 12 fps is sufficient (12 fps is the default frame rate). [¶] 3. For Dimensions, do one of the following: [¶] ■ To specify the Stage size in pixels, enter values in the Width and Height text boxes. The default document size is 550 x 400 pixels. The minimum size is 1 x 1 pixels; the maximum is 2880 x 2880 pixels.</p> <p>For example, Flash MX Professional 2004 selects a modem speed and typical Internet performance (bandwidth information).</p> <p>[<i>Flash MX 2004 Using Flash</i>, pp. 38–39]</p> <p>The Flash Player attempts to meet the frame rate you set; the actual frame rate during playback can vary on different computers. If a document that is downloading reaches a particular frame before the frame's required data has downloaded, the document pauses until the data arrives. [¶]</p> <p>To view downloading performance graphically, you can use the Bandwidth Profiler, which shows how much data is sent for each frame according to the modem speed you specify. The Bandwidth Profiler is divided into two panes. The left pane shows information about the document, the download settings, the state, and streams, if any are included. The right pane shows information about individual frames in the document. [¶]</p> <p>In simulating the downloading speed, Flash uses estimates of typical Internet performance, not the exact modem speed. For example, if you choose to simulate a modem speed of 28.8 Kbps, Flash sets the actual rate to 2.3 Kbps to reflect typical Internet performance. The profiler also compensates for the added compression support for SWF files, which reduces the file size and improves streaming performance. [¶]</p>

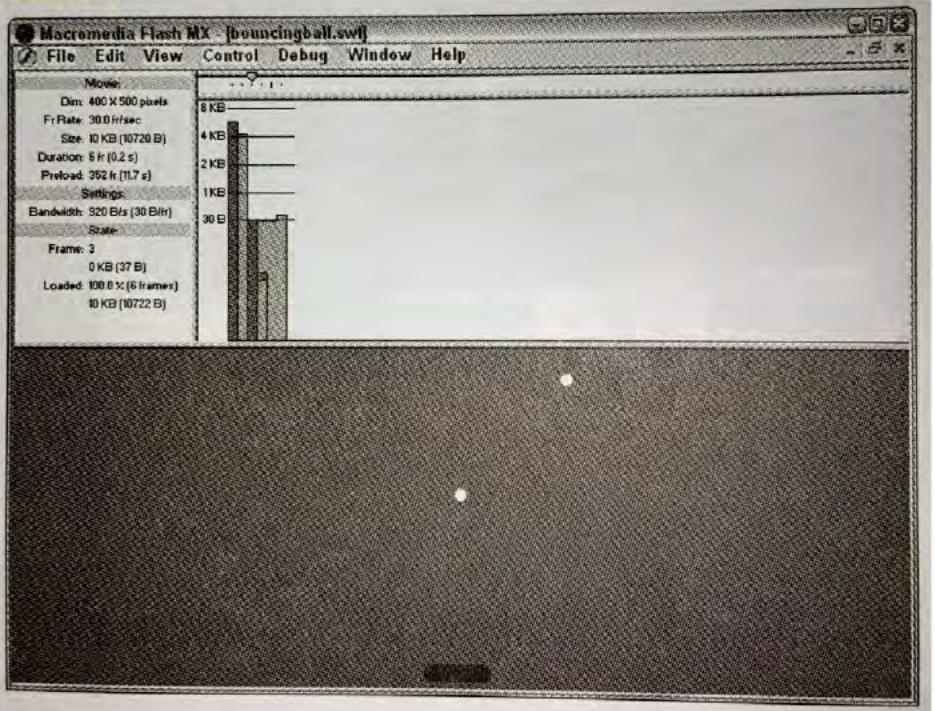
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'579 Claim 15	Reference/Combination
	<p>When external SWF files, GIF and XML files, and variables are streamed into a player by using ActionScript calls such as loadMovie and getUrl, the data flows at the rate set for streaming. The stream rate for the main SWF file is reduced based on the reduction of bandwidth caused by the additional data requests. It's helpful to test your document at each speed you intend to support, and on each computer you intend to support. This helps you ensure that the document doesn't overburden the slowest connection and computer it is designed for. [¶]</p> <p>You can also generate a report of frames that are slowing playback, and then optimize or eliminate some of the content in those frames. See "Optimizing Flash documents" on page 36. [¶]</p> <p>To change the settings for the SWF file created using the Test Movie and Test Scene commands, use File &gt; Publish Settings. See "Publishing Flash documents" on page 281. [¶]</p> <p>To test download performance: [¶] Do one of the following: [¶] Select Control &gt; Test Scene or Control &gt; Test Movie. [¶] If you test a scene or document, Flash publishes the current selection as a SWF file using the settings in the Publish Settings dialog box. (See "Publishing Flash documents" on page 281.) The SWF file opens in a new window and begins playing immediately. [¶] Select File &gt; Open, and select a SWF file. [¶]</p> <p>Select View &gt; Download Settings, and select a download speed to determine the streaming rate that Flash simulates: 14.4 Kbps, 28.8 Kbps, 56 Kbps, DSL, T1 or a User Setting. To enter your own User Setting, select Customize. [¶]</p> <p>When viewing the SWF file, select View &gt; Bandwidth Profiler to display a graph of the downloading performance. [¶] The left side of the profiler displays information about the document, its settings, its state, and streams, if any are included in the document. [¶] The right section of the profiler shows the Timeline header and graph. In the graph, each bar represents an individual frame of the document. The size of the bar corresponds to that frame's size in bytes. The red line beneath the Timeline header indicates whether a given frame streams in real time with the current modem speed set in the Control menu. If a bar extends above the red line, the document must wait for that frame to load. [¶]</p>

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'579 Claim 15	Reference/Combination
	<p>Select View &gt; Simulate Download to turn streaming off or on. [¶] If you turn streaming off, the document starts over without simulating a web connection. [¶]</p> <p>Click a bar on the graph to display settings for the corresponding frame in the left window and stop the document. [¶]</p> <p>If necessary, adjust the view of the graph: [¶] Select View &gt; Streaming Graph to show which frames cause pauses. This default view displays alternating light and dark gray blocks representing each frame. The side of each block indicates its relative byte size. The first frame stores a symbol's contents, so it is often larger than other frames. [¶] Select View &gt; Frame by Frame Graph to display the size of each frame. This view helps you see which frames contribute to streaming delays. If any frame block extends above the red line in the graph, the Flash Player halts playback until the entire frame downloads. [¶]</p> <p>Close the test window to return to the normal authoring environment. [¶] Once you've set up a test environment incorporating the Bandwidth Profiler, you can open any SWF file directly in test mode. The file opens in a Flash Player window, using the Bandwidth Profiler and other selected viewing options. [¶] For more information on debugging your documents, see "Writing and Debugging Scripts" in ActionScript Reference Guide Help. [¶]</p> <p>To generate a report listing the amount of data in the final Flash Player file: [¶] Select File &gt; Publish Settings and click the Flash tab. [¶] Select Generate Size Report. [¶] Click Publish. [¶]</p> <p>Flash generates a text file with the extension .txt. (If the document file is myMovie.fla, the text file is myMovie Report.txt.) The report lists the size of each frame, shape, text, sound, video and ActionScript script by frame.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 390] In addition, Flash files are compact, making them perfect for wireless carrier networks, where transfer rates range between 9.6 and 60 kilobytes per second (Kbps). Mobile devices, unlike desktop computers, have limited storage capability, so the small footprint of Flash is ideal.</p>

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'579 Claim 15	Reference/Combination
	<p>David discloses, via screenshots, the appearance of the Bandwidth Profiler.</p> <p>[David, p. 7]</p>  <p>● 1.6</p>

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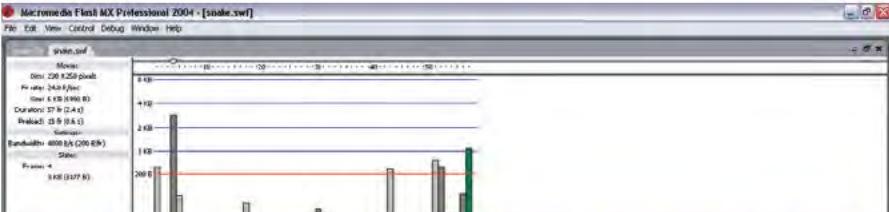
'579 Claim 15	Reference/Combination
	<p>[David, p. 98]</p> <p>● 8.2</p> <p>[David, #18 of 32 unnumbered pages between pages numbered 192 and 193]</p>

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'579 Claim 15	Reference/Combination
	<p>The screenshot shows the Macromedia Flash MX interface. The top menu bar includes File, Edit, View, Control, Debug, Window, and Help. A status bar at the bottom displays "Frame: 37", "8 KB (8664 B)", and "Loaded: 100.0% (49 frames) 323 KB (33707 B)". On the left, a bandwidth monitor window is open, showing a timeline from frame 10 to 40. The monitor displays data rates in kilobits per second (KBps) for each frame, with values ranging from 400 B to 16 KB. The main stage area is currently blank, showing a light gray background with a small cursor icon.</p>

To the extent this limitation is not explicitly disclosed by the Flash MX Professional 2004 system, it is inherent or would have been obvious to a POSA from the teachings of the Flash MX Professional 2004 system, the knowledge of a POSA, and/or one or more of the references identified in JPMC's Invalidity Contentions.

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<p>15[c] monitor utilization of one or more resources of the mobile device over time by an application running on a simulation of the mobile device;</p>	<p>The Flash MX Professional 2004 system discloses this limitation.</p> <p>lower pane, including bandwidth.</p>  <p>Bandwidth Profiler simulating a web connection and download at a speed of 28.8 kbps.</p>  <p>Bandwidth Profiler simulating a web connection and download at a speed of 56 kbps.</p> <p>Screenshots above from the Flash MX Professional 2004 emulator show a plurality of network characteristics, including "Bandwidth" and the amount of time needed for "Preload" for snake.swf.</p>

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	<p data-bbox="376 1241 768 1269">Bandwidth Profiler simulation options.</p> <p data-bbox="376 1353 1470 1495">For example, the Bandwidth Profiler in Flash MX Professional 2004 monitors utilization and/or usage of bandwidth, processor, memory/RAM, and screen, resources of the mobile device, over time by the Flash application running in the Test Movie environment (an application running on a simulation of the mobile device). It displays the utilization of bandwidth over time as a bar graph on a Timeline, while the application runs on a simulation of the mobile device.</p>

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	<p>[<i>Flash MX 2004 Using Flash</i>, pp. 38–39]</p> <p>The Flash Player attempts to meet the frame rate you set; the actual frame rate during playback can vary on different computers. If a document that is downloading reaches a particular frame before the frame's required data has downloaded, the document pauses until the data arrives. [¶]</p> <p>To view downloading performance graphically, you can use the Bandwidth Profiler, which shows how much data is sent for each frame according to the modem speed you specify. The Bandwidth Profiler is divided into two panes. The left pane shows information about the document, the download settings, the state, and streams, if any are included. The right pane shows information about individual frames in the document. [¶]</p> <p>In simulating the downloading speed, Flash uses estimates of typical Internet performance, not the exact modem speed. For example, if you choose to simulate a modem speed of 28.8 Kbps, Flash sets the actual rate to 2.3 Kbps to reflect typical Internet performance. The profiler also compensates for the added compression support for SWF files, which reduces the file size and improves streaming performance. [¶]</p> <p>When external SWF files, GIF and XML files, and variables are streamed into a player by using ActionScript calls such as <code>loadMovie</code> and <code>getUrl</code>, the data flows at the rate set for streaming. The stream rate for the main SWF file is reduced based on the reduction of bandwidth caused by the additional data requests. It's helpful to test your document at each speed you intend to support, and on each computer you intend to support. This helps you ensure that the document doesn't overburden the slowest connection and computer it is designed for. [¶]</p> <p>You can also generate a report of frames that are slowing playback, and then optimize or eliminate some of the content in those frames. See “Optimizing Flash documents” on page 36. [¶]</p> <p>To change the settings for the SWF file created using the Test Movie and Test Scene commands, use File &gt; Publish Settings. See “Publishing Flash documents” on page 281. [¶]</p> <p>To test download performance: [¶] Do one of the following: [¶] Select Control &gt; Test Scene or Control &gt; Test Movie. [¶] If you test a scene or document, Flash publishes the current selection as a SWF file using the settings in the Publish Settings dialog box. (See “Publishing Flash documents” on page 281.) The SWF file opens in a new window and begins playing immediately. [¶] Select File &gt; Open, and select a SWF file. [¶]</p>

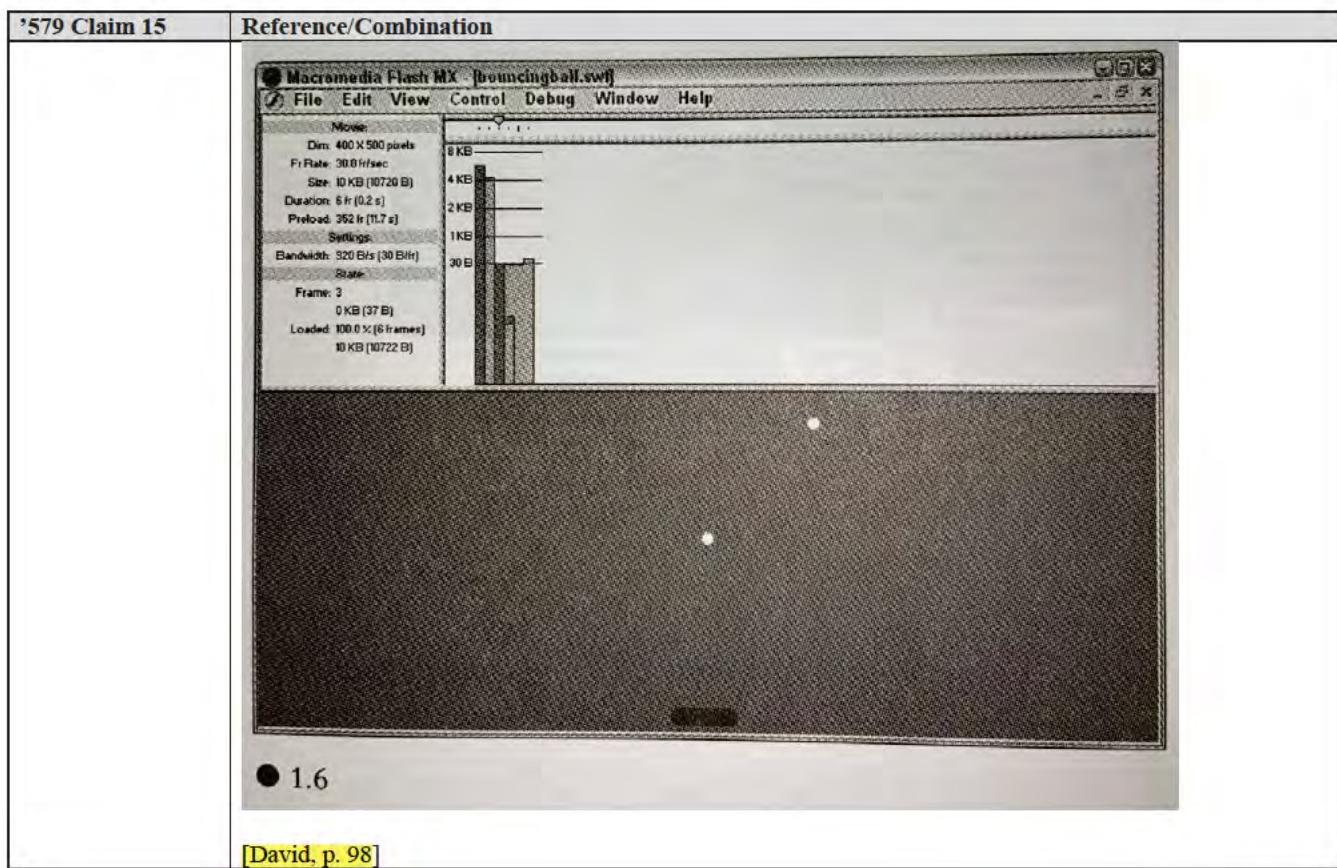
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	<p>Select View &gt; Download Settings, and select a download speed to determine the streaming rate that Flash simulates: 14.4 Kbps, 28.8 Kbps, 56 Kbps, DSL, T1 or a User Setting. To enter your own User Setting, select Customize. [¶]</p> <p>When viewing the SWF file, select View &gt; Bandwidth Profiler to display a graph of the downloading performance. [¶] The left side of the profiler displays information about the document, its settings, its state, and streams, if any are included in the document. [¶] The right section of the profiler shows the Timeline header and graph. In the graph, each bar represents an individual frame of the document. The size of the bar corresponds to that frame's size in bytes. The red line beneath the Timeline header indicates whether a given frame streams in real time with the current modem speed set in the Control menu. If a bar extends above the red line, the document must wait for that frame to load. [¶]</p> <p>Select View &gt; Simulate Download to turn streaming off or on. [¶] If you turn streaming off, the document starts over without simulating a web connection. [¶]</p> <p>Click a bar on the graph to display settings for the corresponding frame in the left window and stop the document. [¶]</p> <p>If necessary, adjust the view of the graph: [¶] Select View &gt; Streaming Graph to show which frames cause pauses. This default view displays alternating light and dark gray blocks representing each frame. The side of each block indicates its relative byte size. The first frame stores a symbol's contents, so it is often larger than other frames. [¶] Select View &gt; Frame by Frame Graph to display the size of each frame. This view helps you see which frames contribute to streaming delays. If any frame block extends above the red line in the graph, the Flash Player halts playback until the entire frame downloads. [¶]</p> <p>Close the test window to return to the normal authoring environment. [¶] Once you've set up a test environment incorporating the Bandwidth Profiler, you can open any SWF file directly in test mode. The file opens in a Flash Player window, using the Bandwidth Profiler and other selected viewing options. [¶] For more information on debugging your documents, see "Writing and Debugging Scripts" in ActionScript Reference Guide Help. [¶]</p>

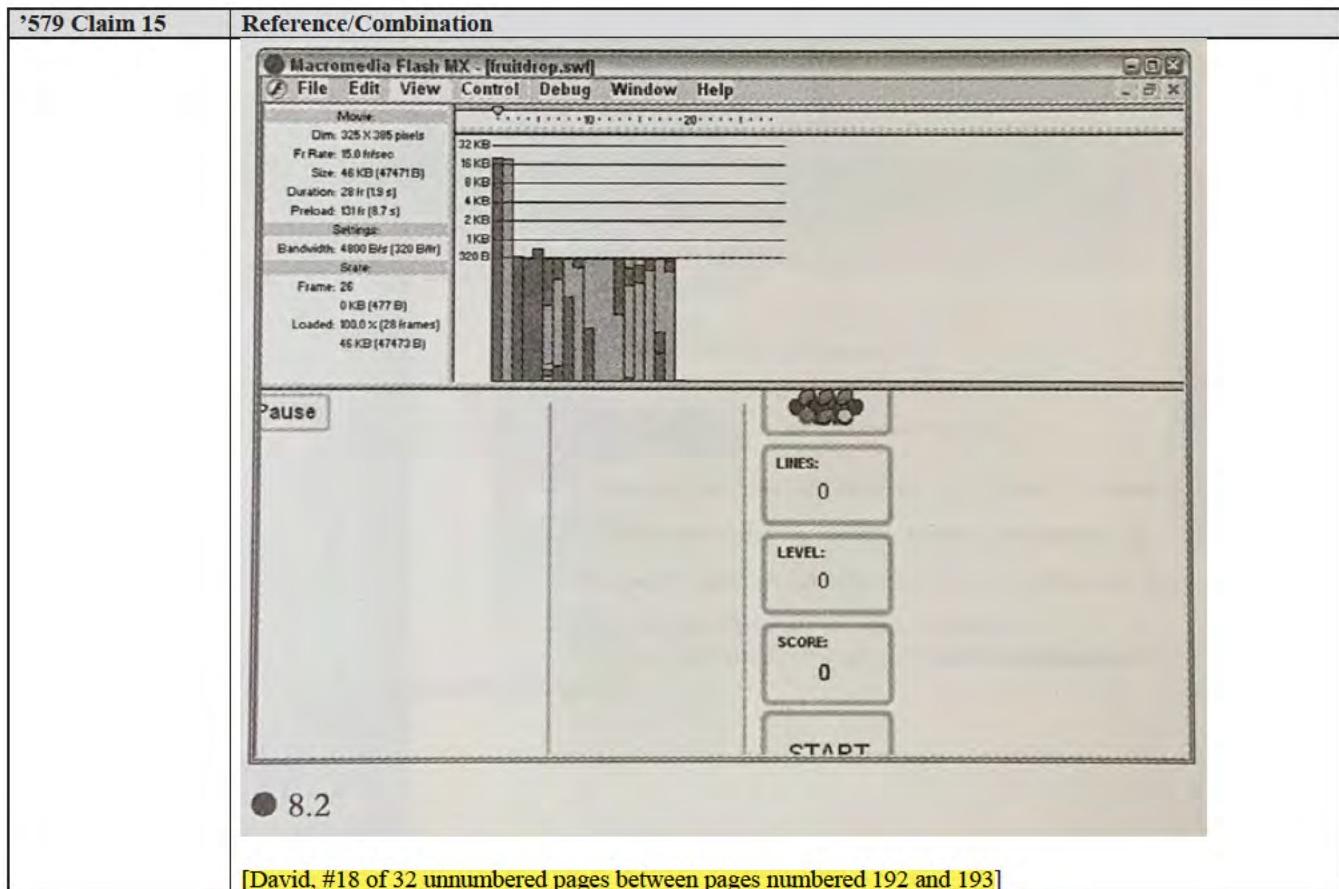
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	<p>To generate a report listing the amount of data in the final Flash Player file: [¶] Select File &gt; Publish Settings and click the Flash tab. [¶] Select Generate Size Report. [¶] Click Publish. [¶]</p> <p>Flash generates a text file with the extension .txt. (If the document file is myMovie.fla, the text file is myMovie Report.txt.) The report lists the size of each frame, shape, text, sound, video and ActionScript script by frame.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 390]</p> <p>In addition, Flash files are compact, making them perfect for wireless carrier networks, where transfer rates range between 9.6 and 60 kilobytes per second (Kbps). Mobile devices, unlike desktop computers, have limited storage capability, so the small footprint of Flash is ideal.</p> <p>David discloses, via screenshots, the appearance of the Bandwidth Profiler.</p> <p>[David, p. 7]</p>

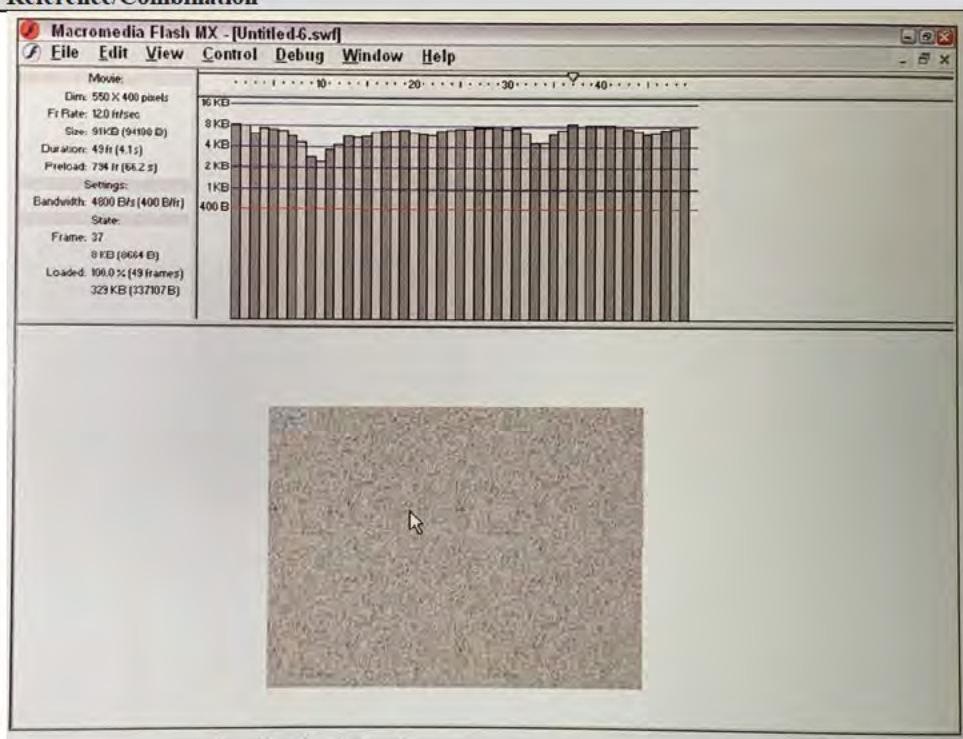
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	 <p>The screenshot shows the Macromedia Flash MX interface. At the top is a menu bar with File, Edit, View, Control, Debug, Window, and Help. Below the menu is a status bar displaying movie properties: Dim: 550 X 400 pixels, Fr Rate: 12.0 Hz/sec, Size: 91KB (9490 B), Duration: 49 ft (4:15), Preload: 734 ft (66.2 s). On the left is a sidebar with settings for Bandwidth (4800 B/s [400 B/ft]), State, Frame (37), and Load (100.0% [49 frames], 323 KB [137107 B]). The main area contains a bandwidth profiler graph with vertical bars representing data transfer over time, and a preview window below it showing a textured gray square.</p> <p>The Flash Player, used for testing Flash applications and included in the Bandwidth Profiler, monitors processor utilization and frame rate.</p> <p>[Flash MX 2004 Using Flash, p. 286]</p>

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	<p>Select Quality options to determine the trade-off between processing time and appearance, as follows. This option sets the QUALITY parameter's value in the object and embed tags. [¶] Low favors playback speed over appearance and does not use anti-aliasing. [¶]</p> <p>Auto Low emphasizes speed at first but improves appearance whenever possible. Playback begins with anti-aliasing turned off. If Flash Player detects that the processor can handle it, anti-aliasing is turned on. [¶] Auto High emphasizes playback speed and appearance equally at first but sacrifices appearance for playback speed if necessary. Playback begins with anti-aliasing turned on. If the actual frame rate drops below the specified frame rate, anti-aliasing is turned off to improve playback speed. Use this setting to emulate the View &gt; Antialias setting in Flash.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 151]</p> <p>The frame rate, the speed at which the animation is played, is measured in number of frames per second. A frame rate that's too slow makes the animation appear to stop and start; a frame rate that's too fast blurs the details of the animation. A frame rate of 12 frames per second (fps) usually gives the best results on the web. QuickTime and AVI movies generally have a frame rate of 12 fps, while the standard motion-picture rate is 24 fps. [¶] The complexity of the animation and the speed of the computer on which the animation is being played affect the smoothness of the playback. Test your animations on a variety of machines to determine optimum frame rates. [¶] Because you specify only one frame rate for the entire Flash document, it's a good idea to set this rate before you begin creating animation. See "Creating or opening a document and setting properties" on page 9.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 9]</p> <p>Creating or opening a document and setting properties [¶] You can create a new document or open a previously saved document as you work in Flash. In Windows, you can use the New File button to open a document of the same type as the last document created. [¶]</p> <p>To set the size, frame rate, background color, and other properties of a new or existing document, you use the Document Properties dialog box. You can also use the Property inspector to set properties for an existing document. The Property inspector makes it easy to access and change the most commonly used attributes of a document. For more information on the Property inspector, see "Using panels and the Property inspector" in Getting Started Help.</p>

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	<p>[<i>Flash MX 2004 Using Flash</i>, p. 10]</p> <p>To set properties for a new or existing document in the Document Properties dialog box: [¶] 1 With the document open, select Modify &gt; Document. [¶] The Document Properties dialog box appears. [¶] 2 For Frame Rate, enter the number of animation frames to be displayed every second. For most computer-displayed animations, especially those playing from a website, 8 fps (frames per second) to 12 fps is sufficient (12 fps is the default frame rate).</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 38]</p> <p>The Flash Player attempts to meet the frame rate you set; the actual frame rate during playback can vary on different computers.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 306]</p> <p>(Optional) Specifies the level of anti-aliasing to be used during playback of your application. Because anti-aliasing requires a faster processor to smooth each frame of the SWF file before it is rendered on the viewer's screen, select a value based on whether speed or appearance is your top priority: [¶] Low favors playback speed over appearance and never uses anti-aliasing. [¶]</p> <p>Autolow emphasizes speed at first but improves appearance whenever possible. Playback begins with anti-aliasing turned off. If Flash Player detects that the processor can handle it, anti-aliasing is turned on. [¶]</p> <p>Autohigh emphasizes playback speed and appearance equally at first but sacrifices appearance for playback speed if necessary. Playback begins with anti-aliasing turned on. If the frame rate drops below the specified frame rate, anti-aliasing is turned off to improve playback speed. Use this setting to emulate the Antialias command in Flash (View &gt; Preview Mode &gt; Antialias).</p> <p>[<i>Flash MX 2004 Getting Started with Flash</i>, p. 21]</p> <p>The Timeline status display at the bottom of the Timeline indicates the selected frame number, the current frame rate, and the elapsed time to the current frame. [¶] Note: When an animation is played, the actual frame rate is displayed; this may differ from the document frame rate if the computer can't display the animation quickly enough.</p>

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	<p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, pp. 15–16]</p> <p>Performance optimization [¶] CPU speed in mobile phones varies among models and is typically much slower than the CPU speed in current desktop computers. Therefore, it is extremely important to consider application performance and optimization from the beginning of each project for creating Flash Lite content created for mobile phones. [¶] Note: In Flash MX Professional 2004, you can find tips on optimizing Flash applications. (Select Help &gt; Using Flash -&gt; Search and enter optimizing movies in the Keyword Searchtext box.) [¶] If you follow the simple guidelines described in this document to author your Flash Lite content, you can create rich and compelling content despite CPU limitations. [¶]</p> <p>Animation [¶] When creating animated content for a mobile phone, it is important to keep in mind the phone's CPU limitations. The following guidelines can help prevent your Flash Lite content from running slowly: [¶] • If you need to provide intense or complex animation, experiment with changing the quality setting of the content. The default quality setting is Medium. [¶] To change the quality setting in Flash MX Professional 2004, select File &gt; Publish Settings, and select the HTML tab. Select a quality setting from the Quality pop-up menu. [¶] Because changing the quality setting might noticeably affect the visual quality of the Flash Lite content, make sure to thoroughly test the SWF file.</p> <p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 19]</p> <p>Device speed and frames per second [¶] If the project contains static images, it's not likely that the device processor speed will be an issue. The complexity of Flash requires some important trade-offs when developing content for mobile phones. Until mobile phones have faster processors and there are improvements to other internal components, you must make adjustments to provide an experience that does not appear sluggish to users; otherwise, they won't use the application. [¶] Try to avoid full-screen wipes, fades, and animations. Remember that updating many pixels at a time can be slow, depending on the content. The performance of your Flash application depends on the number of open applications, available phone memory, processor speed, and screen resolution.</p> <p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 48]</p> <p>To create a Flash Lite 1.1 compatible SWF file: [¶] 1. In Flash MX Professional 2004, create a new document and name it FlashLiteTest.fla. [¶] 2. Select File &gt; Publish Settings, and then the Flash tab. In the Version pop-up menu, select Flash Lite 1.1. Click OK. [¶] 3. From the Property inspector select the Size button, and</p>

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	<p>change your document properties so that width = 240, height = 266, and Frame Rate = 15. Click OK. Make sure to use the appropriate frame rate on the actual devices.</p> <p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 57]</p> <p>The development kit includes a variety of sample files (FLA and SWF files) that demonstrate many of the concepts and applications that are described in this document. These examples are included to help you create content for mobile phones. The files include capabilities examples, processor detectors, and data-driven examples. Be sure to view the readme.txt file in the folder associated with each sample file.</p> <p>The Flash Player further monitors memory/RAM utilization, evidenced by for example setting maximum memory sizes, detecting out-of-memory errors and buffer overruns, and determining the memory used and remaining.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 280]</p> <p>Buffer overrun protection prevents the intentional misuse of external files in a Flash document to overwrite a user's memory or insert destructive code such as a virus. This prevents a Flash document from reading or writing data outside the document's designated memory space on a user's system. Buffer overrun protection is enabled automatically.</p> <p>[<i>Flash MX Professional 2004 Flash Lite Authoring Guidelines for the i-mode Service by NTT DoCoMo</i>, p. 23]</p> <p>Set the run-time memory available to Flash Lite movies running in the i-mode HTML simulator.</p> <p>[<i>Flash MX Professional 2004 Flash Lite Authoring Guidelines for the i-mode Service by NTT DoCoMo</i>, pp. 41 – 42]</p> <p>This appendix lists the possible information, warning, and error messages you might encounter when creating movies for Flash Lite for i-mode. [...] SWFS033 [!] Not enough memory to perform operation. [!] The Flash player was unable to get enough memory to finish the operation</p>

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	<p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 33] The <code>GetFreePlayerMemory()</code> function returns the amount of memory, in kilobytes, currently available to Flash Lite. [...] The <code>GetTotalPlayerMemory()</code> function returns the total amount of memory, in kilobytes, allocated to Flash Lite.</p> <p>Moreover, concerns about mobile devices' limited CPU, memory, and network speeds pervade the <i>Flash MX Professional 2004</i> manuals' discussions of developing Flash content for mobile devices.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 390] In addition, Flash files are compact, making them perfect for wireless carrier networks, where transfer rates range between 9.6 and 60 kilobytes per second (Kbps). Mobile devices, unlike desktop computers, have limited storage capability, so the small footprint of Flash is ideal.</p> <p>[<i>Flash MX Professional 2004 Flash Lite User Guide</i>, p. 5] Macromedia has created a new Flash Player version, called Macromedia® Flash™ Lite, that runs on a new class of consumer mobile devices. This format is designed to run optimally on devices with limited resources (memory, processor speed, display area). [...] With Macromedia Flash MX Professional 2004, you can author, preview, publish, and validate content for Flash Lite.</p> <p>[<i>Flash MX Professional 2004 Flash Lite Authoring Guidelines for the i-mode Service by NTT DoCoMo</i>, p. 10] There are limitations on file size and run-time memory usage for Flash Lite movies running on i-mode phones. There is a prescribed limit on how large a web page can be, whether it includes Flash Lite movies or not. For 505i phones, this limit is 20KB. Full details can be found at the DoCoMo website (see Appendix D, "References," on page 47). This limit applies to an i-mode page's HTML, SWF content, and all graphic images combined. Web pages larger than this limit cannot be downloaded to an i-mode phone and no error message appears. This limitation also applies to Flash Lite movies played directly in the browser without being embedded in an i-mode compatible HTML file. [¶]</p>

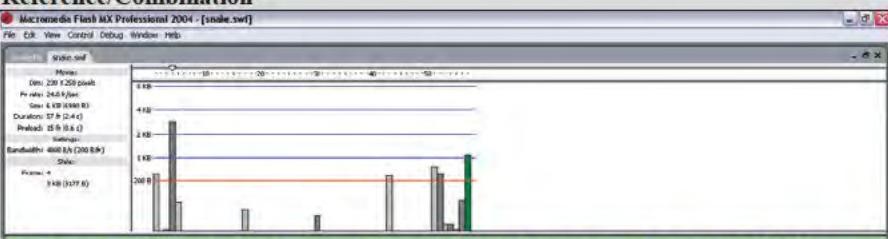
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	<p>The run-time memory available to Flash Lite movies running on i-mode phones is limited and may vary from model to model. Generally, for the 505i phones, this limit is not less than 200KB. Because Flash MX Professional 2004 does not provide a mechanism for checking a phone's run-time memory consumption, Macromedia strongly recommends that you test all content on actual i-mode phones.</p> <p>[<i>Flash MX Professional 2004 Flash Lite Authoring Guidelines for the i-mode Service by NTT DoCoMo</i>, p. 11]</p> <p>CPU speed in i-mode phones varies from model to model, and is typically much slower than current desktop computers. Therefore, it is extremely important to consider movie performance and optimization from the beginning of each project. The optimization recommendations for creating any Flash movie also apply to Flash Lite movies created for i-mode phones. For the latter, their importance is amplified. [¶] Note: In Flash MX Professional 2004, you can find tips on optimizing Flash movies—select Help &gt; Using Flash -&gt; Search and enter optimizing movies in the keyword search text box. [¶] If you follow some simple guidelines, as described in this document, to author your movies, you can create rich and compelling content despite CPU limitations.</p> <p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 17]</p> <p>Flash Lite generally uses vector graphics to define content, which can tax a phone's CPU when rendering complex graphics and animations. In general, the more vectors that are manipulated on the Stage, the more CPU power is required. This is also true for Flash movies delivered on desktop computers. However, a mobile phone is far less powerful than desktop computer, so you should avoid taxing the CPU. [¶]</p> <p>When creating content for mobile phones, it is sometimes better to use bitmaps instead of vectors because they require less CPU power to animate. For example, a road map of a large city would have too many complex shapes to scroll and animate well on a mobile phone if it were created as a vector graphic; a bitmap would work much better. [¶]</p> <p>Using bitmaps produces larger files than using vector images, so take care during development to find the right balance of CPU versus file size and runtime memory requirements. Because of mobile phones' smaller screens, slower data transmission speeds, limited memory, and slower CPU speeds, you should take extra care in planning and testing.</p>

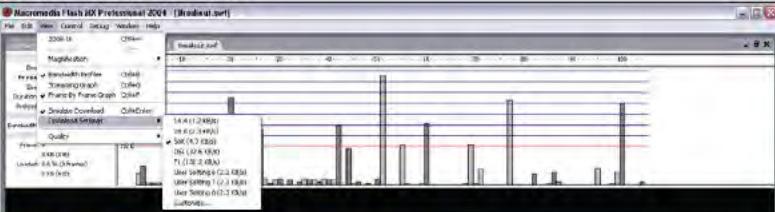
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	<p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 17]</p> <p>Device speed and frames per second [¶] If the project contains static images, it's not likely that the device processor speed will be an issue. The complexity of Flash requires some important trade-offs when developing content for mobile phones. Until mobile phones have faster processors and there are improvements to other internal components, you must make adjustments to provide an experience that does not appear sluggish to users; otherwise, they won't use the application. [¶] Try to avoid full-screen wipes, fades, and animations. Remember that updating many pixels at a time can be slow, depending on the content. The performance of your Flash application depends on the number of open applications, available phone memory, processor speed, and screen resolution.</p> <p>To the extent this limitation is not explicitly disclosed by the Flash MX Professional 2004 system, it is inherent or would have been obvious to a POSA from the teachings of the Flash MX Professional 2004 system, the knowledge of a POSA, and/or one or more of the references identified in JPMC's Invalidity Contentions.</p>
15[d] display a representation of one or more of the monitored resource;	<p>The Flash MX Professional 2004 system discloses this limitation.</p>  <p>Bandwidth Profiler simulating a web connection and download at a speed of 28.8 kbps.</p>

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	 <p>Bandwidth Profiler simulating a web connection and download at a speed of 56 kbps. Screenshots above from the Flash MX Professional 2004 emulator show a plurality of network characteristics, including "Bandwidth" and the amount of time needed for "Preload" for snake.swf.</p> 

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	 <p>Bandwidth Profiler simulation options.</p> <p>For example, the Bandwidth Profiler in Flash MX Professional 2004 displays a bar chart of the Flash application's bandwidth utilization.</p> <p>[Flash MX 2004 Using Flash, pp. 38–39]</p> <p>The Flash Player attempts to meet the frame rate you set; the actual frame rate during playback can vary on different computers. If a document that is downloading reaches a particular frame before the frame's required data has downloaded, the document pauses until the data arrives. [¶]</p> <p>To view downloading performance graphically, you can use the Bandwidth Profiler, which shows how much data is sent for each frame according to the modem speed you specify. The Bandwidth Profiler is divided into two panes. The left pane shows information about the document, the download settings, the state, and streams, if any are included. The right pane shows information about individual frames in the document. [¶]</p> <p>In simulating the downloading speed, Flash uses estimates of typical Internet performance, not the exact modem speed. For example, if you choose to simulate a modem speed of 28.8 Kbps, Flash sets the actual rate to 2.3 Kbps to reflect typical Internet performance. The profiler also compensates for the added compression support for SWF files, which reduces the file size and improves streaming performance. [¶]</p> <p>When external SWF files, GIF and XML files, and variables are streamed into a player by using ActionScript calls such as loadMovie and getUrl, the data flows at the rate set for streaming. The stream rate for the main SWF file is reduced based on the reduction of bandwidth caused by the additional data requests. It's helpful to test your document at each speed you intend to support, and on each computer you intend to support. This</p>

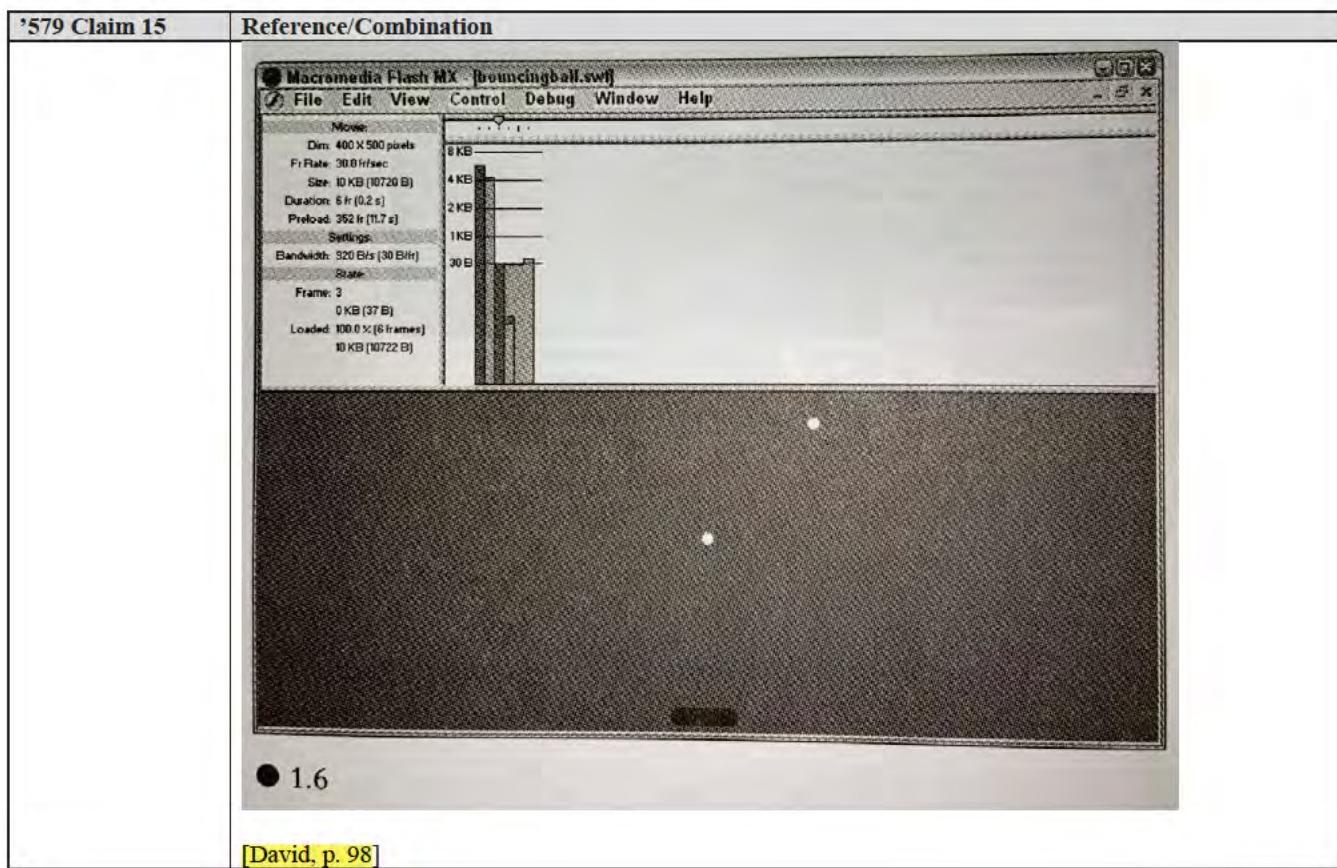
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	<p>helps you ensure that the document doesn't overburden the slowest connection and computer it is designed for. [¶]</p> <p>You can also generate a report of frames that are slowing playback, and then optimize or eliminate some of the content in those frames. See "Optimizing Flash documents" on page 36. [¶]</p> <p>To change the settings for the SWF file created using the Test Movie and Test Scene commands, use File &gt; Publish Settings. See "Publishing Flash documents" on page 281. [¶]</p> <p>To test download performance: [¶] Do one of the following: [¶] Select Control &gt; Test Scene or Control &gt; Test Movie. [¶] If you test a scene or document, Flash publishes the current selection as a SWF file using the settings in the Publish Settings dialog box. (See "Publishing Flash documents" on page 281.) The SWF file opens in a new window and begins playing immediately. [¶] Select File &gt; Open, and select a SWF file. [¶]</p> <p>Select View &gt; Download Settings, and select a download speed to determine the streaming rate that Flash simulates: 14.4 Kbps, 28.8 Kbps, 56 Kbps, DSL, T1 or a User Setting. To enter your own User Setting, select Customize. [¶]</p> <p>When viewing the SWF file, select View &gt; Bandwidth Profiler to display a graph of the downloading performance. [¶] The left side of the profiler displays information about the document, its settings, its state, and streams, if any are included in the document. [¶] The right section of the profiler shows the Timeline header and graph. In the graph, each bar represents an individual frame of the document. The size of the bar corresponds to that frame's size in bytes. The red line beneath the Timeline header indicates whether a given frame streams in real time with the current modem speed set in the Control menu. If a bar extends above the red line, the document must wait for that frame to load. [¶]</p> <p>Select View &gt; Simulate Download to turn streaming off or on. [¶] If you turn streaming off, the document starts over without simulating a web connection. [¶]</p> <p>Click a bar on the graph to display settings for the corresponding frame in the left window and stop the document. [¶]</p>

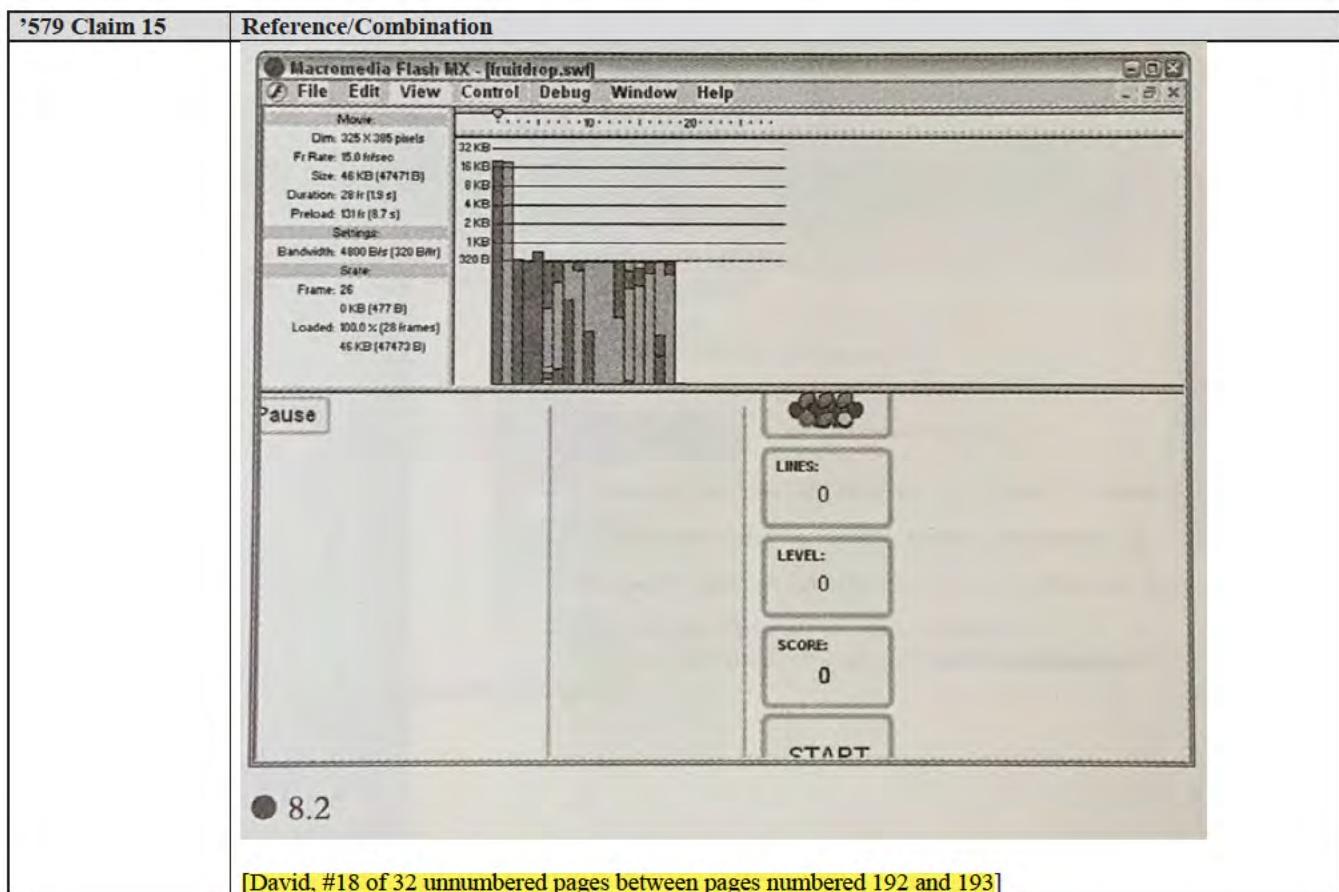
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	<p>If necessary, adjust the view of the graph: [¶] Select View &gt; Streaming Graph to show which frames cause pauses. This default view displays alternating light and dark gray blocks representing each frame. The side of each block indicates its relative byte size. The first frame stores a symbol's contents, so it is often larger than other frames. [¶] Select View &gt; Frame by Frame Graph to display the size of each frame. This view helps you see which frames contribute to streaming delays. If any frame block extends above the red line in the graph, the Flash Player halts playback until the entire frame downloads. [¶]</p> <p>Close the test window to return to the normal authoring environment. [¶] Once you've set up a test environment incorporating the Bandwidth Profiler, you can open any SWF file directly in test mode. The file opens in a Flash Player window, using the Bandwidth Profiler and other selected viewing options. [¶] For more information on debugging your documents, see "Writing and Debugging Scripts" in ActionScript Reference Guide Help. [¶]</p> <p>To generate a report listing the amount of data in the final Flash Player file: [¶] Select File &gt; Publish Settings and click the Flash tab. [¶] Select Generate Size Report. [¶] Click Publish. [¶]</p> <p>Flash generates a text file with the extension .txt. (If the document file is myMovie.fla, the text file is myMovie Report.txt.) The report lists the size of each frame, shape, text, sound, video and ActionScript script by frame.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 390]</p> <p>In addition, Flash files are compact, making them perfect for wireless carrier networks, where transfer rates range between 9.6 and 60 kilobytes per second (Kbps). Mobile devices, unlike desktop computers, have limited storage capability, so the small footprint of Flash is ideal.</p> <p>David discloses, via screenshots, the appearance of the Bandwidth Profiler.</p> <p>[David, p. 7]</p>

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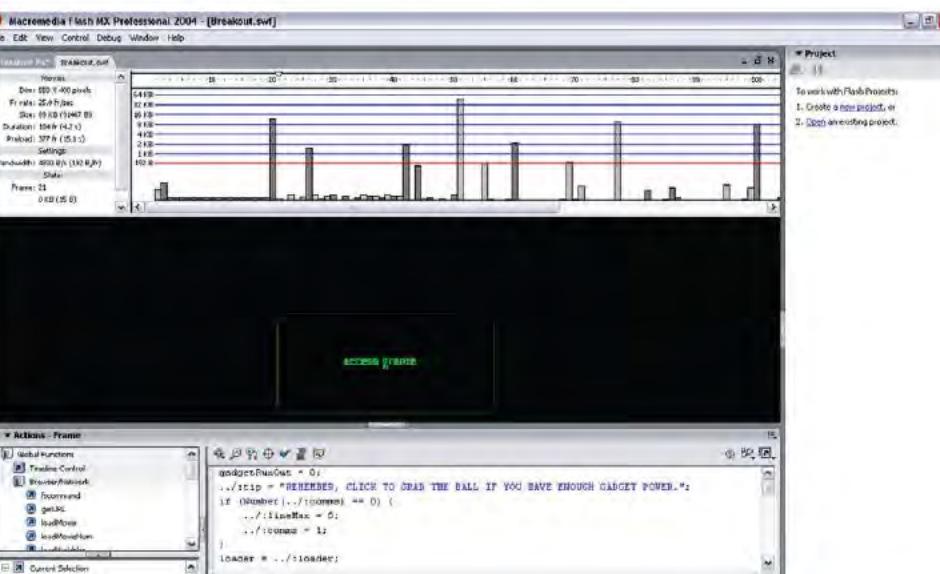


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	A screenshot of the Macromedia Flash MX software interface. The title bar reads "Macromedia Flash MX - [Untitled46.swf]". The menu bar includes File, Edit, View, Control, Debug, Window, and Help. On the left, a "Movie" panel displays various properties: Dim: 550 X 400 pixels, Fr Rate: 12.0 Hz/sec, Size: 91KB (94100 B), Duration: 49fr (4.1s), Preload: 734 H (64.2 s). Below that is a "Settings" panel with Bandwidth: 4800 B/s (400 Bit/s) and State: Frame: 37, 8 KB (8664 B). At the bottom, it shows Loaded: 100.0% (49 frames) and 323 KB (33707 B). The main workspace shows a small, dark, textured square in the center, with a cursor arrow pointing towards it.

To the extent this limitation is not explicitly disclosed by the Flash MX Professional 2004 system, it is inherent or would have been obvious to a POSA from the teachings of the Flash MX Professional 2004 system, the knowledge of a POSA, and/or one or more of the references identified in JPMC's Invalidity Contentions.

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<p>15[e] correspond the utilization of a specific displayed resource at a given time with one or more functions, or code, or both of the application responsible for that utilization;</p>	<p>The Flash MX Professional 2004 system discloses this limitation.</p>  <p>Screenshot of Flash MX Professional 2004 interface with "Actions – Frame" window showing the state of the Flash application at frame 21, including an ActionScript script, and indicating the use of bandwidth per frame of the application.</p> <pre data-bbox="608 1146 1077 1237"> //strip = "REMEMBER, CLICK TO GRAB THE BALL IF YOU HAVE ENOUGH GADGET POWER." if (Gmmer != -1) {     if (lineMax == 0) {         //lineMax = 1;         //rcomes = 1;     }     LOADER = .../loader; } </pre>

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	<p>For example, the Bandwidth Profiler in Flash MX Professional 2004 corresponds to the utilization of the displayed bandwidth at a frame (a given time) of the Flash application with the ActionScript, symbols, function calls, and graphical assets (functions and/or code) responsible for that utilization. [¶]</p> <p>[<i>Flash MX 2004 Using Flash</i>, pp. 38–39] The Flash Player attempts to meet the frame rate you set; the actual frame rate during playback can vary on different computers. If a document that is downloading reaches a particular frame before the frame's required data has downloaded, the document pauses until the data arrives. [¶]</p> <p>To view downloading performance graphically, you can use the Bandwidth Profiler, which shows how much data is sent for each frame according to the modem speed you specify. The Bandwidth Profiler is divided into two panes. The left pane shows information about the document, the download settings, the state, and streams, if any are included. The right pane shows information about individual frames in the document. [¶]</p> <p>In simulating the downloading speed, Flash uses estimates of typical Internet performance, not the exact modem speed. For example, if you choose to simulate a modem speed of 28.8 Kbps, Flash sets the actual rate to 2.3 Kbps to reflect typical Internet performance. The profiler also compensates for the added compression support for SWF files, which reduces the file size and improves streaming performance. [¶]</p> <p>When external SWF files, GIF and XML files, and variables are streamed into a player by using ActionScript calls such as <code>loadMovie</code> and <code>getUrl</code>, the data flows at the rate set for streaming. The stream rate for the main SWF file is reduced based on the reduction of bandwidth caused by the additional data requests. It's helpful to test your document at each speed you intend to support, and on each computer you intend to support. This helps you ensure that the document doesn't overburden the slowest connection and computer it is designed for. [¶]</p> <p>You can also generate a report of frames that are slowing playback, and then optimize or eliminate some of the content in those frames. See “Optimizing Flash documents” on page 36. [¶]</p> <p>To change the settings for the SWF file created using the Test Movie and Test Scene commands, use File &gt; Publish Settings. See “Publishing Flash documents” on page 281. [¶]</p>

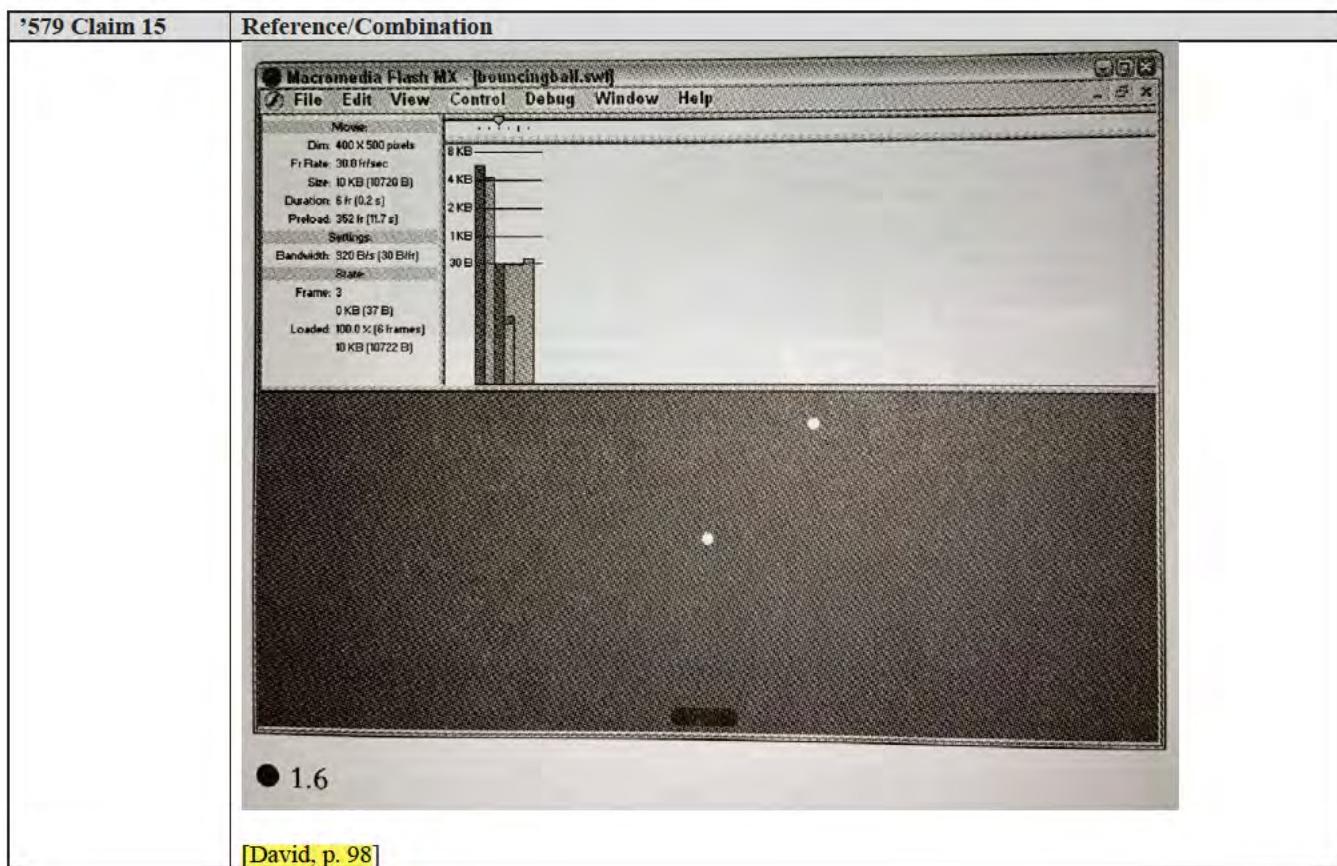
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	<p>To test download performance: [¶] Do one of the following: [¶] Select Control &gt; Test Scene or Control &gt; Test Movie. [¶] If you test a scene or document, Flash publishes the current selection as a SWF file using the settings in the Publish Settings dialog box. (See “Publishing Flash documents” on page 281.) The SWF file opens in a new window and begins playing immediately. [¶] Select File &gt; Open, and select a SWF file. [¶]</p> <p>Select View &gt; Download Settings, and select a download speed to determine the streaming rate that Flash simulates: 14.4 Kbps, 28.8 Kbps, 56 Kbps, DSL, T1 or a User Setting. To enter your own User Setting, select Customize. [¶]</p> <p>When viewing the SWF file, select View &gt; Bandwidth Profiler to display a graph of the downloading performance. [¶] The left side of the profiler displays information about the document, its settings, its state, and streams, if any are included in the document. [¶] The right section of the profiler shows the Timeline header and graph. In the graph, each bar represents an individual frame of the document. The size of the bar corresponds to that frame’s size in bytes. The red line beneath the Timeline header indicates whether a given frame streams in real time with the current modem speed set in the Control menu. If a bar extends above the red line, the document must wait for that frame to load. [¶]</p> <p>Select View &gt; Simulate Download to turn streaming off or on. [¶] If you turn streaming off, the document starts over without simulating a web connection. [¶]</p> <p>Click a bar on the graph to display settings for the corresponding frame in the left window and stop the document. [¶]</p> <p>If necessary, adjust the view of the graph: [¶] Select View &gt; Streaming Graph to show which frames cause pauses. This default view displays alternating light and dark gray blocks representing each frame. The side of each block indicates its relative byte size. The first frame stores a symbol’s contents, so it is often larger than other frames. [¶] Select View &gt; Frame by Frame Graph to display the size of each frame. This view helps you see which frames contribute to streaming delays. If any frame block extends above the red line in the graph, the Flash Player halts playback until the entire frame downloads. [¶]</p> <p>Close the test window to return to the normal authoring environment. [¶] Once you’ve set up a test environment incorporating the Bandwidth Profiler, you can open any SWF file directly in test mode. The file</p>

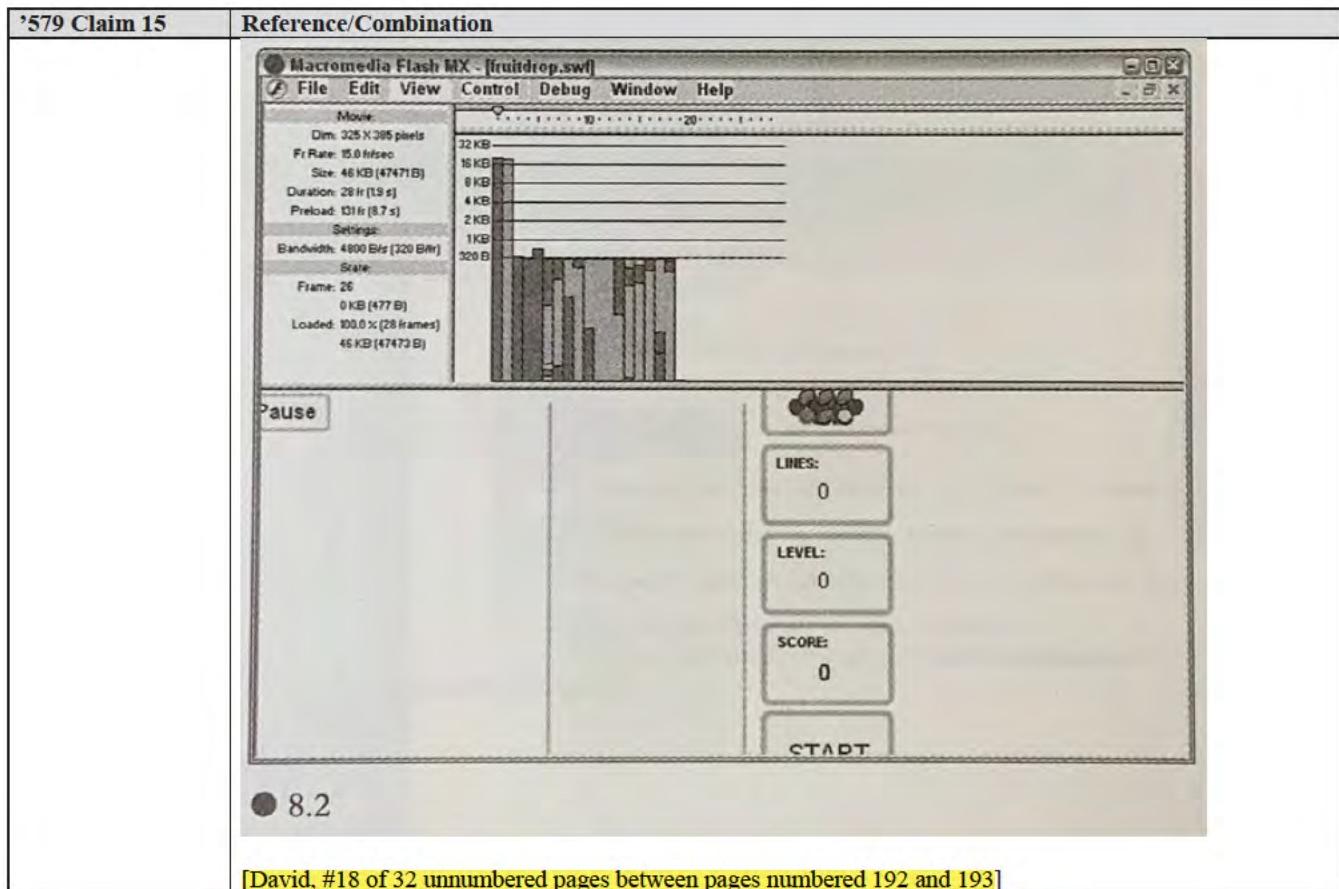
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	<p>opens in a Flash Player window, using the Bandwidth Profiler and other selected viewing options. [¶] For more information on debugging your documents, see “Writing and Debugging Scripts” in ActionScript Reference Guide Help. [¶]</p> <p>To generate a report listing the amount of data in the final Flash Player file: [¶] Select File &gt; Publish Settings and click the Flash tab. [¶] Select Generate Size Report. [¶] Click Publish. [¶]</p> <p>Flash generates a text file with the extension .txt. (If the document file is myMovie.fla, the text file is myMovie Report.txt.) The report lists the size of each frame, shape, text, sound, video and ActionScript script by frame.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 390]</p> <p>In addition, Flash files are compact, making them perfect for wireless carrier networks, where transfer rates range between 9.6 and 60 kilobytes per second (Kbps). Mobile devices, unlike desktop computers, have limited storage capability, so the small footprint of Flash is ideal.</p> <p>David discloses, via screenshots, the appearance of the Bandwidth Profiler.</p> <p>[David, p. 7]</p>

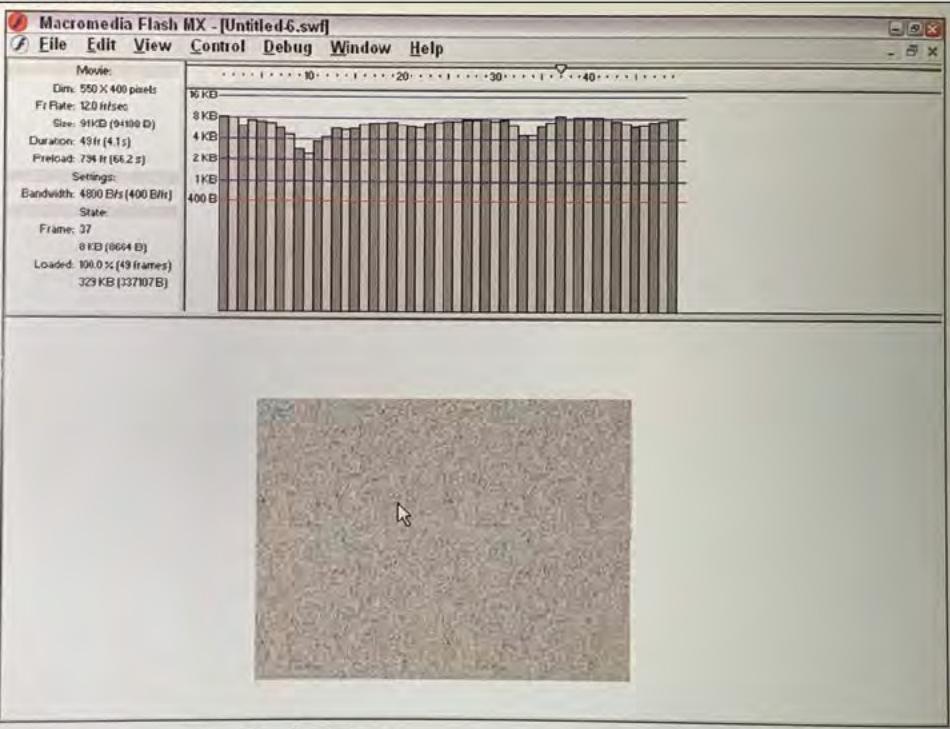
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	 <p>The screenshot shows the Macromedia Flash MX interface. The top menu bar includes File, Edit, View, Control, Debug, Window, and Help. The left sidebar displays movie settings: Dim: 550 X 400 pixels, Fr Rate: 12.0 Hz/sec, Size: 91KB (94100 B), Duration: 49fr (4.1s), Preload: 734 H (64.2 s). The Settings section shows Bandwidth: 4800 B/s (400 Bit/s) and State: Frame: 37, 8 KB (8664 B). The timeline at the top has frame markers from 10 to 40. Below the timeline is a vertical bar chart representing frame sizes, with labels for 16 KB, 8 KB, 4 KB, 2 KB, 1 KB, and 400 B. The preview window below shows a dark, textured square with a small white cursor icon in the center.</p> <p>To the extent this limitation is not explicitly disclosed by the Flash MX Professional 2004 system, it is inherent or would have been obvious to a POSA from the teachings of the Flash MX Professional 2004 system, the knowledge of a POSA, and/or one or more of the references identified in JPMC's Invalidity Contentions.</p>

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15[f] initiate transmission of the application on a simulation of the mobile device, or to the physical mobile device, or both.	<p>The Flash MX Professional 2004 system discloses this limitation.</p> <p>For example, the Bandwidth Profiler in Flash MX Professional 2004 initiates publishing a SWF file (the application) and transmitting it in the Test Movie environment (on a simulation of the mobile device) in order to profile the Flash application's bandwidth usage.</p> <p><i>[Flash MX 2004 Using Flash, pp. 38–39]</i></p> <p>The Flash Player attempts to meet the frame rate you set; the actual frame rate during playback can vary on different computers. If a document that is downloading reaches a particular frame before the frame's required data has downloaded, the document pauses until the data arrives. [¶]</p> <p>To view downloading performance graphically, you can use the Bandwidth Profiler, which shows how much data is sent for each frame according to the modem speed you specify. The Bandwidth Profiler is divided into two panes. The left pane shows information about the document, the download settings, the state, and streams, if any are included. The right pane shows information about individual frames in the document. [¶]</p> <p>In simulating the downloading speed, Flash uses estimates of typical Internet performance, not the exact modem speed. For example, if you choose to simulate a modem speed of 28.8 Kbps, Flash sets the actual rate to 2.3 Kbps to reflect typical Internet performance. The profiler also compensates for the added compression support for SWF files, which reduces the file size and improves streaming performance. [¶]</p> <p>When external SWF files, GIF and XML files, and variables are streamed into a player by using ActionScript calls such as loadMovie and getUrl, the data flows at the rate set for streaming. The stream rate for the main SWF file is reduced based on the reduction of bandwidth caused by the additional data requests. It's helpful to test your document at each speed you intend to support, and on each computer you intend to support. This helps you ensure that the document doesn't overburden the slowest connection and computer it is designed for. [¶]</p> <p>You can also generate a report of frames that are slowing playback, and then optimize or eliminate some of the content in those frames. See "Optimizing Flash documents" on page 36. [¶]</p>

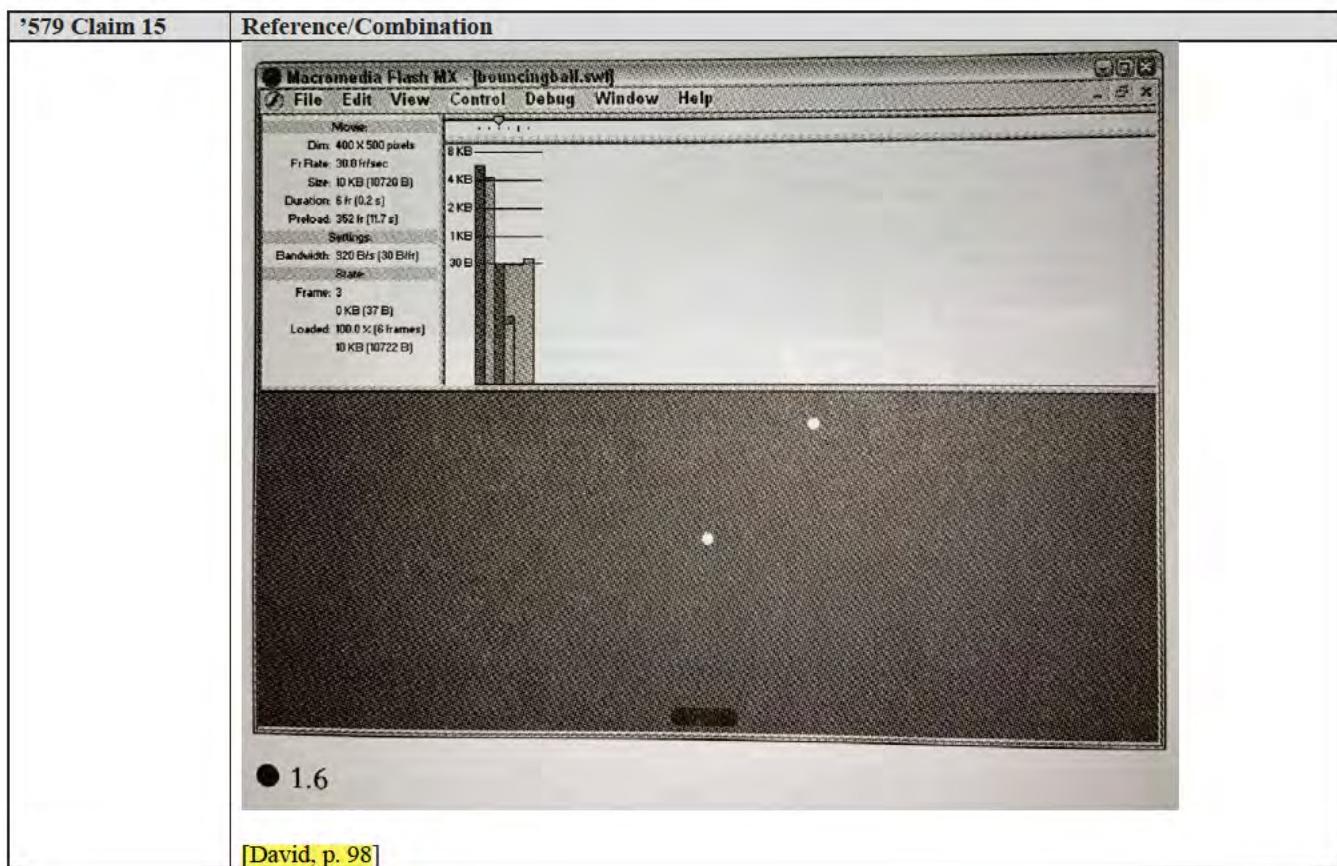
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	<p>To change the settings for the SWF file created using the Test Movie and Test Scene commands, use File &gt; Publish Settings. See “Publishing Flash documents” on page 281. [¶]</p> <p>To test download performance: [¶] Do one of the following: [¶] Select Control &gt; Test Scene or Control &gt; Test Movie. [¶] If you test a scene or document, Flash publishes the current selection as a SWF file using the settings in the Publish Settings dialog box. (See “Publishing Flash documents” on page 281.) The SWF file opens in a new window and begins playing immediately. [¶] Select File &gt; Open, and select a SWF file. [¶]</p> <p>Select View &gt; Download Settings, and select a download speed to determine the streaming rate that Flash simulates: 14.4 Kbps, 28.8 Kbps, 56 Kbps, DSL, T1 or a User Setting. To enter your own User Setting, select Customize. [¶]</p> <p>When viewing the SWF file, select View &gt; Bandwidth Profiler to display a graph of the downloading performance. [¶] The left side of the profiler displays information about the document, its settings, its state, and streams, if any are included in the document. [¶] The right section of the profiler shows the Timeline header and graph. In the graph, each bar represents an individual frame of the document. The size of the bar corresponds to that frame’s size in bytes. The red line beneath the Timeline header indicates whether a given frame streams in real time with the current modem speed set in the Control menu. If a bar extends above the red line, the document must wait for that frame to load. [¶]</p> <p>Select View &gt; Simulate Download to turn streaming off or on. [¶] If you turn streaming off, the document starts over without simulating a web connection. [¶]</p> <p>Click a bar on the graph to display settings for the corresponding frame in the left window and stop the document. [¶]</p> <p>If necessary, adjust the view of the graph: [¶] Select View &gt; Streaming Graph to show which frames cause pauses. This default view displays alternating light and dark gray blocks representing each frame. The side of each block indicates its relative byte size. The first frame stores a symbol’s contents, so it is often larger than other frames. [¶] Select View &gt; Frame by Frame Graph to display the size of each frame. This view helps you see which frames contribute to streaming delays. If any frame block extends above the red line in the graph, the Flash Player halts playback until the entire frame downloads. [¶]</p>

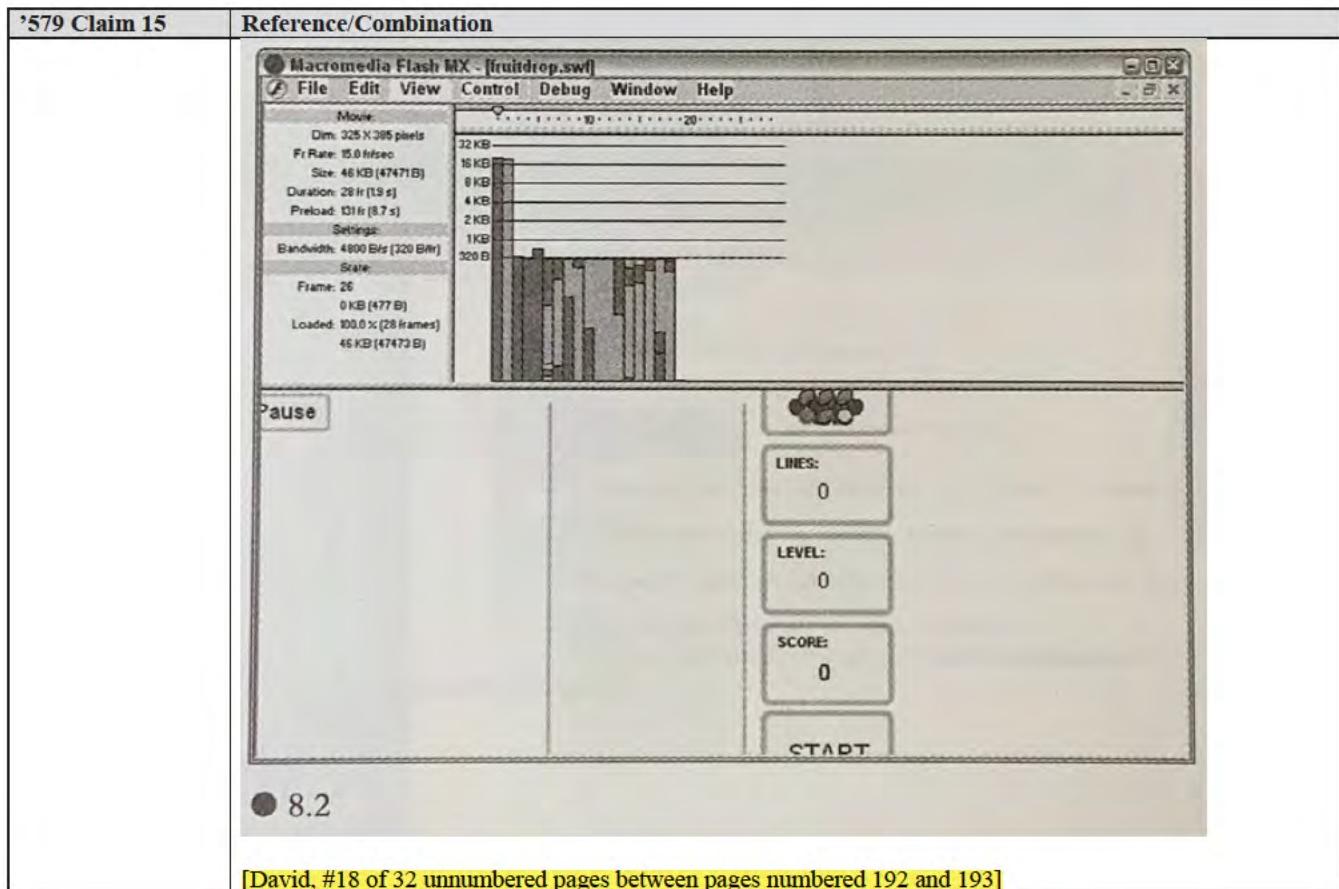
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	<p>Close the test window to return to the normal authoring environment. [¶] Once you've set up a test environment incorporating the Bandwidth Profiler, you can open any SWF file directly in test mode. The file opens in a Flash Player window, using the Bandwidth Profiler and other selected viewing options. [¶] For more information on debugging your documents, see "Writing and Debugging Scripts" in ActionScript Reference Guide Help. [¶]</p> <p>To generate a report listing the amount of data in the final Flash Player file: [¶] Select File &gt; Publish Settings and click the Flash tab. [¶] Select Generate Size Report. [¶] Click Publish. [¶]</p> <p>Flash generates a text file with the extension .txt. (If the document file is myMovie.fla, the text file is myMovie Report.txt.) The report lists the size of each frame, shape, text, sound, video and ActionScript script by frame.</p> <p>[<i>Flash MX 2004 Using Flash</i>, p. 390] In addition, Flash files are compact, making them perfect for wireless carrier networks, where transfer rates range between 9.6 and 60 kilobytes per second (Kbps). Mobile devices, unlike desktop computers, have limited storage capability, so the small footprint of Flash is ideal.</p> <p>David discloses, via screenshots, the appearance of the Bandwidth Profiler.</p> <p>[David, p. 7]</p>

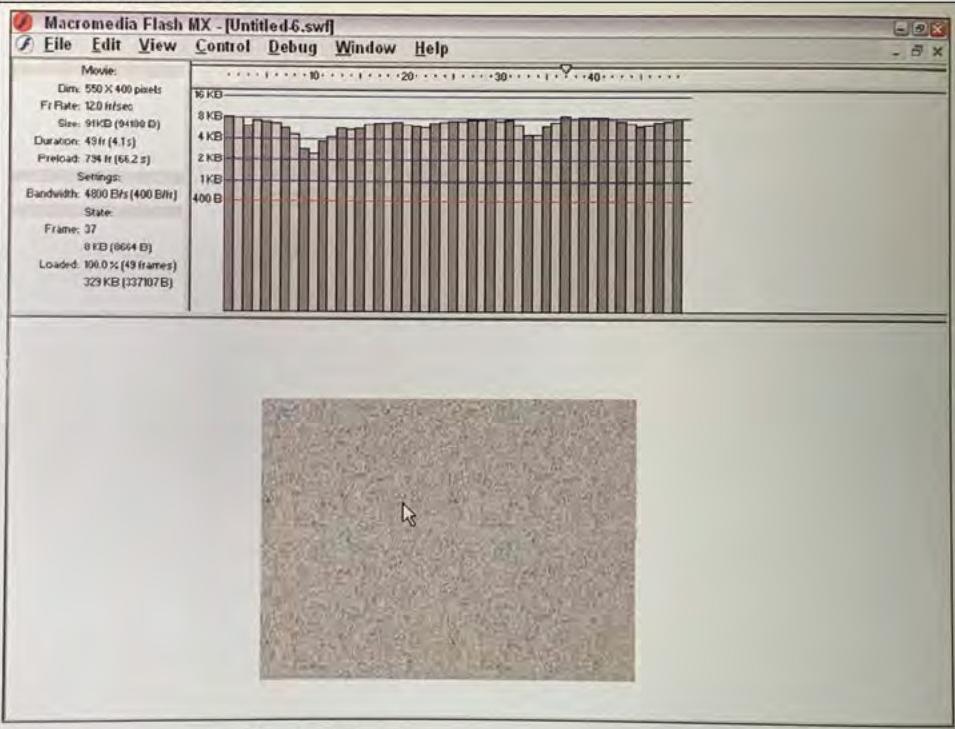
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	 <p>The screenshot shows the Macromedia Flash MX interface. The top menu bar includes File, Edit, View, Control, Debug, Window, and Help. A status bar at the bottom displays movie properties: Dim: 550 X 400 pixels, Fr Rate: 12.0 Hz/sec, Size: 91KB (94100 B), Duration: 49fr (4.1s), Preload: 734 fr (68.2 s). The left panel shows a bandwidth graph with vertical bars representing data transfer over time, ranging from 400B to 16KB. The right panel shows a preview window with a small, dark, textured square.</p> <p>For example, Flash MX Professional 2004 initiates publishing a SWF file (the application) for transmission on the NTT DoCoMo i-mode HTML Simulator (on a simulation of the mobile device).</p>

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	<p>[Flash MX Professional 2004 Flash Lite Authoring Guidelines for the i-mode Service by NTT DoCoMo, p. 22]</p> <p>To use the i-mode HTML Simulator: [¶] 1 Download and install the i-mode HTML Simulator application from the DoCoMo website (for a link to the website, see Appendix D, “References,” on page 47). Follow the online instructions. Note the folder where the program files are installed. [¶] 2 Start the i-mode HTML Simulator application. In Windows Explorer, or another program displaying filenames or icons, go to the folder where the Simulator program files are installed (noted in step 1) and double-click CSim.exe. The i-mode HTML Simulator window appears: [¶]</p>  <p>You can click the Simulator keys with your mouse and the keys will operate in the same way as they would on an actual i-mode phone. The Select key is the key with a circle icon, surrounded by the arrow keys, immediately under the screen display.</p>

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	<p>[<i>Flash MX Professional 2004 Flash Lite Authoring Guidelines for the i-mode Service by NTT DoCoMo</i>, p. 23]</p> <p>The following function menu options for testing your Flash Lite movies are available: [¶] Open URL[:] Enables you to type in the URL of the file you want the Simulator to test. You can also browse for a file on your local computer or use a bookmark. (A bookmark is a shortcut for a file URL or pathname.)</p> <p>For example, Flash MX Professional 2004 initiates transmission of the Flash application to the physical mobile device, such as an actual 505i phone, using desktop-to-phone synchronization software.</p> <p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 49]</p> <p>Select File &gt; Publish to save the SWF file as FlashLiteTest.swf. [¶] In the mobile phone web browser or from a desktop that can transfer a file using desktop-to-phone synchronization software, transfer the file to the mobile phone and verify that it works correctly.</p> <p>[<i>Flash MX Professional 2004 Flash Lite 1.1 Authoring Guidelines</i>, p. 51]</p> <p>Test your Macromedia Flash Lite 1.1 SWF content frequently on actual mobile phones. This step may seem obvious, but it is often overlooked. It is especially important when you develop Flash Lite 1.1 SWF files for mobile phones. No matter how much phone emulation you do, the final delivery remains the most important part of the development cycle. Emulation is helpful for much of the testing, but it is no substitute for testing on actual mobile phones.</p> <p>[<i>Flash MX Professional 2004 Flash Lite Authoring Guidelines for the i-mode Service by NTT DoCoMo</i>, p. 21]</p> <p>Test your Flash Lite movies frequently on actual 505i phones. This advice may sound obvious, but this step is often overlooked and is especially important for developing Flash Lite movies for i-mode phones. No matter how much phone emulation a developer does, the final delivery remains the most important step in the development cycle. Emulation is helpful for much of the testing, but it is no substitute for testing on actual 505i phones. [¶]</p>